GAS

ENGINEERING • UTILIZATION • LOAD-BUILDING • MANAGEMENT

EMCO No. 5 Pressed Steel Meter,
EMCO Balanced Valve Regulator
and NORDSTROM Valves

PITTSBURGH EQUITABLE METER COMPANY
MERCO NORDSTROM VALVE CO.
NEW YORK · BUFFALO · PHILADELPHIA
KANSAS CITY · TULSA · LOS ANGELES
Main Offices - PITTSBURGH, PA.
DES MOINES · CHICAGO · COLUMBIA
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MAY 1938 • • 25 CENTS

ALL TYPES AND SIZES FOR ALL PURPOSES AND PRESSURES

Preference for Reliance Regulators over a period of twenty-eight years is based upon their accurate design, simplicity of construction, positive action and large capacity. With a complete line—each type built to serve a specific purpose—Reliance offers the most efficient Regulator for any gas distribution system—natural, manufactured, liquid petroleum, propane or butane.

Reliance Regulators are available for all gas pressure control purposes, each in a full range of sizes.

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SINCE 1910

A full set of Bulletins on Reliance Regulators and Dust Filters constitutes an encyclopedia of data and information covering district, commercial, industrial and domestic control of gas pressures.

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RELIANCE REGULATORS

CRANE DOUBLE DISC VALVES for oil country service

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INTERNATIONAL PETROLEUM EXPOSITION
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For oil country pressures of 500 pounds W. O. G., it's the 340E double disc gate valve of Crane Ferrosteel that will give you more durable, more economical performance. With a tensile strength that is 35% greater than that of cast iron, Crane Ferrosteel valves of rugged and massive design, offer a higher safety factor in every service for which they are recommended.

It's what's inside that counts in valve construction. In the 340E, as in all Crane valves, it's the soundness of design and the thoroughness of Crane engineering that assure a longer life of valve efficiency in any service.

Use the Crane 340E for oil or gas field work, in refinery service, in pump houses, on pipe lines and high pressure water lines. Made in sizes of 2 to 24 inches with screwed or flanged ends—in both non-rising stem and O. S. & Y. types. Available with brass trim or in all iron.

Double disc valves are furnished for pressures up to 1200 pounds W. O. G. For applications where a wedge disc valve is preferred, as in the handling of steam, it will pay you to investigate Crane Ferrosteel Wedge Gate valves for working pressures up to 800 pounds.

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PLUMBING • HEATING • PUMPS

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SOMETHING WE *Never* FORGET—

GASOLINE plants must earn the maximum net profits for their owners! Simple statement of fact though this may be, its tremendous importance to you lies in the fact that the degree of net profit a gasoline plant will return to its owners is something decided *before construction is completed!*

Whether a plant will produce ordinary profits or maximum net profits is something developed on drafting boards, in design rooms, in material and equipment selection and in field construction. It is in the soundness of plant engineering that ordinary gasoline recovery finds elevation to maximum recovery. It is in the correctness of design that plant operating efficiency is developed to its highest peak and low operating and overhead costs are reduced to the absolute minimum. It is sound judgment in material and equipment selection that extends plant life over many added years. It is in quality construction and workmanship that plant maintenance costs are held to the lowest.

In the building of gasoline plants, this organization keeps ever in mind the fact that it has an obligation to its clients that goes beyond drawings, blue prints, equipment and material assembly. This organization holds firm to the belief that these are the means to gain an end and that that end is to so engineer — to so design — and to so build that plant owners are assured the realization of their basic objective — maximum profits through maximum production at lowest operating and depreciation costs.

PARKHILL-WADE
CONSULTING AND
CONSTRUCTION ENGINEERS
973 NORTH MAIN STREET
LOS ANGELES CALIFORNIA

GASOLINE PLANTS

AN AMBASSADOR IN THE *Basement!*

THE gas industry could not have a more able representative in America's homes than the Payne Beverlyair Unit.

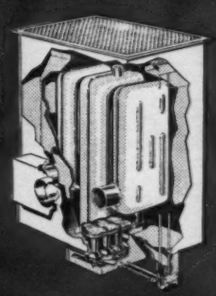
This outstanding appliance accomplishes four big tasks with unbelievable quietness, smoothness and economy. It heats, cleans and circulates air — and automatically humidifies.

It builds a reputation for Gas . . . while it builds a load on your lines.

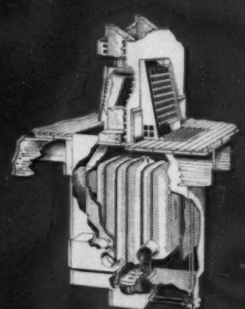
The Payne Beverlyair Unit is made in the nation's most modern furnace plant — made by an organization that has devoted 25 years to the production of gas-fired appliances exclusively!

THE IDEAL FUEL GAS

ENVOYS OF COMFORT



The Payne Floor Furnace is the most economical and efficient unit of its type ever built. Requires no basement.



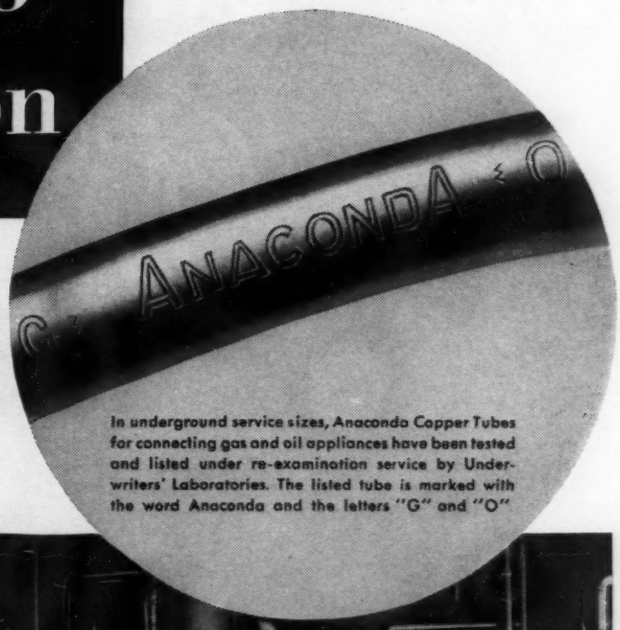
Payne Duplex-Register Furnaces heat two separate rooms or suites, on one or two floors. Automatic control optional.

The Payne Forced Air Unit makes spring-time permanent in your home. Warms in winter, ventilates in summer.

Payne

FURNACE & SUPPLY CO., INC.
BEVERLY HILLS • CALIFORNIA

Resistance to Soil Corrosion



In underground service sizes, Anaconda Copper Tubes for connecting gas and oil appliances have been tested and listed under re-examination service by Underwriters' Laboratories. The listed tube is marked with the word Anaconda and the letters "G" and "O"

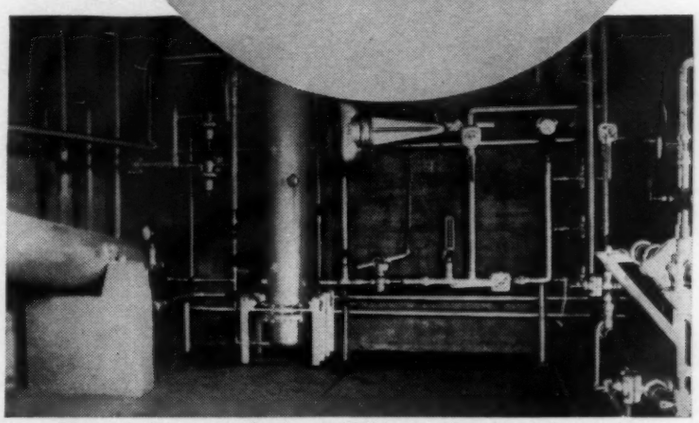
. . . that's why Anaconda Copper Tubes were selected for entire gas system of Navajo Reservation Community

IN THE butane-propane distribution system for the Navajo Reservation, Shiprock, New Mexico, all piping is Anaconda Copper Tubing—including the 8-mile, 2-inch line from the oil field. Copper was the logical answer to the corrosion problem, for the engineers realized that rustable piping in the highly corrosive soil of that region would soon have been rendered worthless.

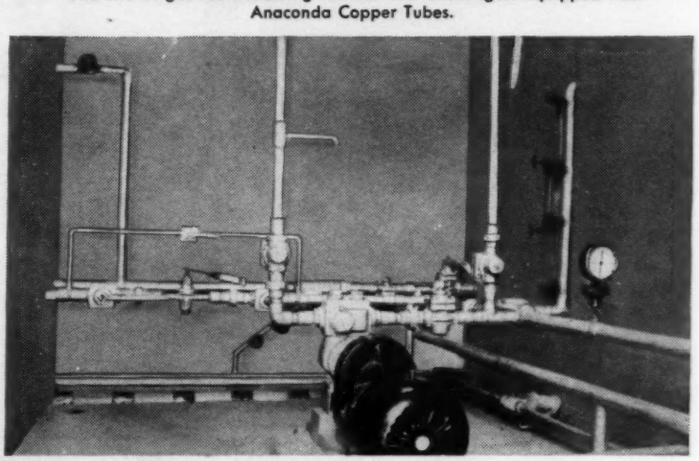
Anaconda Copper Tubes were likewise ideal for the heat exchangers which cool the two Diesel engines in the power plant, for tank room lines and other piping in this larger and well-known project.

The Shiprock installation should again prove what so many gas companies already know . . . that Anaconda Copper Tubes for small mains and services are genuine economy. Although the original material cost of Copper is higher, its far superior durability makes the *average annual cost much less.*

The Anaconda trade-mark is your assurance of uniform quality. Anaconda Copper Tubes and both Solder-and Flared-Type Fittings are carried in stock by leading distributors. 8852



One end of gas room showing vertical heat exchangers equipped with Anaconda Copper Tubes.



Tank room showing pump in foreground. Main line of Anaconda Copper to tanks at left. Header and gage column of one tank at right.

ANACONDA

Anaconda Copper Tubes

THE AMERICAN BRASS COMPANY, General Offices: WATERBURY, CONNECTICUT

Offices and Agencies in Principal Cities • In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ont.

CLEAN GAS MAKES SATISFIED CUSTOMERS

Surest way to cut service costs is to cut the need for service . . . reduce complaints to a minimum. In these days of small appliance apertures, delicate mechanism CLEAN Gas is more important than ever. It helps keep service flowing silently, smoothly, unfailingly.

From coast to coast Operating Engineers have found one way of making CLEAN gas certain. They are equipping exclusively with Blaw-Knox Gas Cleaners. You'll find it's profitable to follow the trend. See for yourself that "as GAS flows, demand grows".

BLAW-KNOX
GAS CLEANERS

BLAW-KNOX DIVISION of Blaw-Knox Company · FARMERS BANK BLDG. · PITTSBURGH, PA.

AN honest doubt about the ability of a pipe material to meet all the qualifications for long and economical service may be unwarranted or it may be a danger signal. Cast iron pipe is beyond doubt. Service records running into centuries prove that cast iron pipe possesses the strength, toughness and stubborn resistance to corrosion which a pipe material must have for long and economical ground service.

Lithographed on stone by James E. Allen for U. S. Pipe & Foundry Co.
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U.S. cast iron PIPE

SUPER-DE LAVAUD CENTRIFUGAL CAST IRON PIPE

U. S. Pit Cast Pipe U. S. Mechanical Joint Pipe
U. S. Threaded Cast Iron Pipe
U. S. Ni-Resist Cast Iron Pipe
U. S. Flexible Joint Pipe U. S. Cast Iron Culverts
Alloy and Gray Iron Castings
U. S. Cast Iron Roof Plates

Cast iron and alloy cast iron pipe centrifugally or pit cast—for water works, gas, sewerage and drainage service as well as industrial uses involving corrosives.

U. S. PIPE & FOUNDRY CO.
BURLINGTON, NEW JERSEY
Foundries and Sales Offices throughout the U. S.

Announcing the New Laminated

NO-OX-ID-IZED DIELECTRIC WRAPPERS

for Underground Pipe Protection

Dearborn announces new developments in Wrappers. Some of the outstanding features are as follows:

1. Increased dielectric strength.
2. Especially valuable for use in connection with cathodic protection.
3. Ability to retard the action of soil organisms (bacteria and mold).
4. The nature of these wrappers provides self sealing seams and great flexibility which insures conformity to the undercoating.
5. Resistant to soil attachment and penetration.
6. Laminated construction and absolute freedom from pinholes is a great advantage over all types of processed, matted or woven materials. Undercoatings are protected from loss or damage.
7. Convenience in handling which has always been associated with NO-OX-ID products. NO-OX-ID and NO-OX-ID-IZED Wrappers are designed for both machine and hand application, and therefore meet all application requirements.

• • •

In these latest developments, Dearborn offers the combined results of twenty years of active laboratory research and field experience. Combinations of NO-OX-ID and NO-OX-ID-IZED Dielectric Wrappers can be recommended to meet all conditions of exposure.

DEARBORN CHEMICAL COMPANY

NO-OX-ID
IRON + OX = RUST
TRADE MARK
The Original Rust Preventive

310 South Michigan Avenue
CHICAGO

205 East 42nd Street
NEW YORK

807 Mateo Street
LOS ANGELES

X marks the spot

PENTALARM

THE WARNING ODOR FOR FUEL GASES

Playing the role of the infallible "X"—marking, by its penetrating odor, all danger spots where gas is escaping—**PENTALARM** serves as one of the greatest safety allies of modern gas distributing systems.

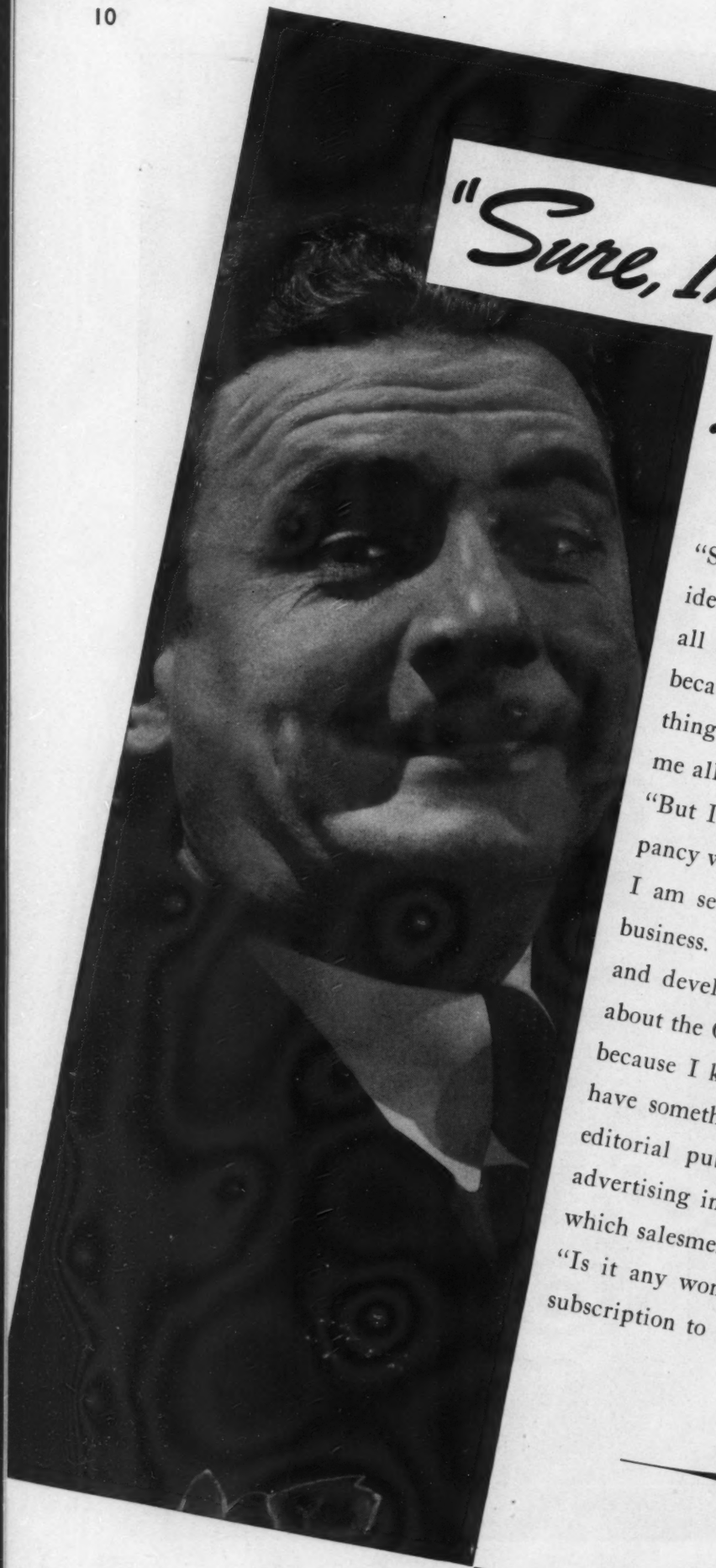
With **PENTALARM** on the job, escaping gas cannot go unnoticed! Broken or corroded pipes "announce" themselves to the entire community through the far-reaching, unmistakable odor of **PENTALARM**—and repair gangs are rushed to the exact spot. There are no costly, long-continued gas leaks that run up operating costs and endanger lives and property.

A very small amount of **PENTALARM**—mixed with the gas flowing through the system—gives continuous and effective odorization. The equipment for introducing **PENTALARM** into the system is simply and inexpensively constructed from materials on hand in your own plant. In fact, the entire annual cost of **PENTALARM** odorization is so small that no gas producer or distributor can afford NOT to have this positive, permanent protection.

Pentalarm Your Pipelines!

SHARPLES SOLVENTS

THE SHARPLES SOLVENTS CORP., 23rd and Westmoreland Streets, Philadelphia, Pennsylvania



"Sure, I'm a FUNNY GUY ... sometimes!"

"Salesmen say I'm a 'funny guy' . . . have an idea that I never take them seriously. Well, it's all right with me if they keep on thinking so, because I'm a busy man and if I didn't do something to discourage these lads, they'd bother me all day long.

"But I put aside that 'protective mask' of flippancy when I pick up my copy of *GAS*. Then I am serious enough. Those editors know my business. They keep me in touch with trends and developments and give me practical ideas about the Gas industry. And I read the ads, too, because I know they are in there because they have something to offer—not because they get editorial publicity. As a matter of fact, the advertising in *GAS* gives me a good steer on which salesmen I *should* take seriously.

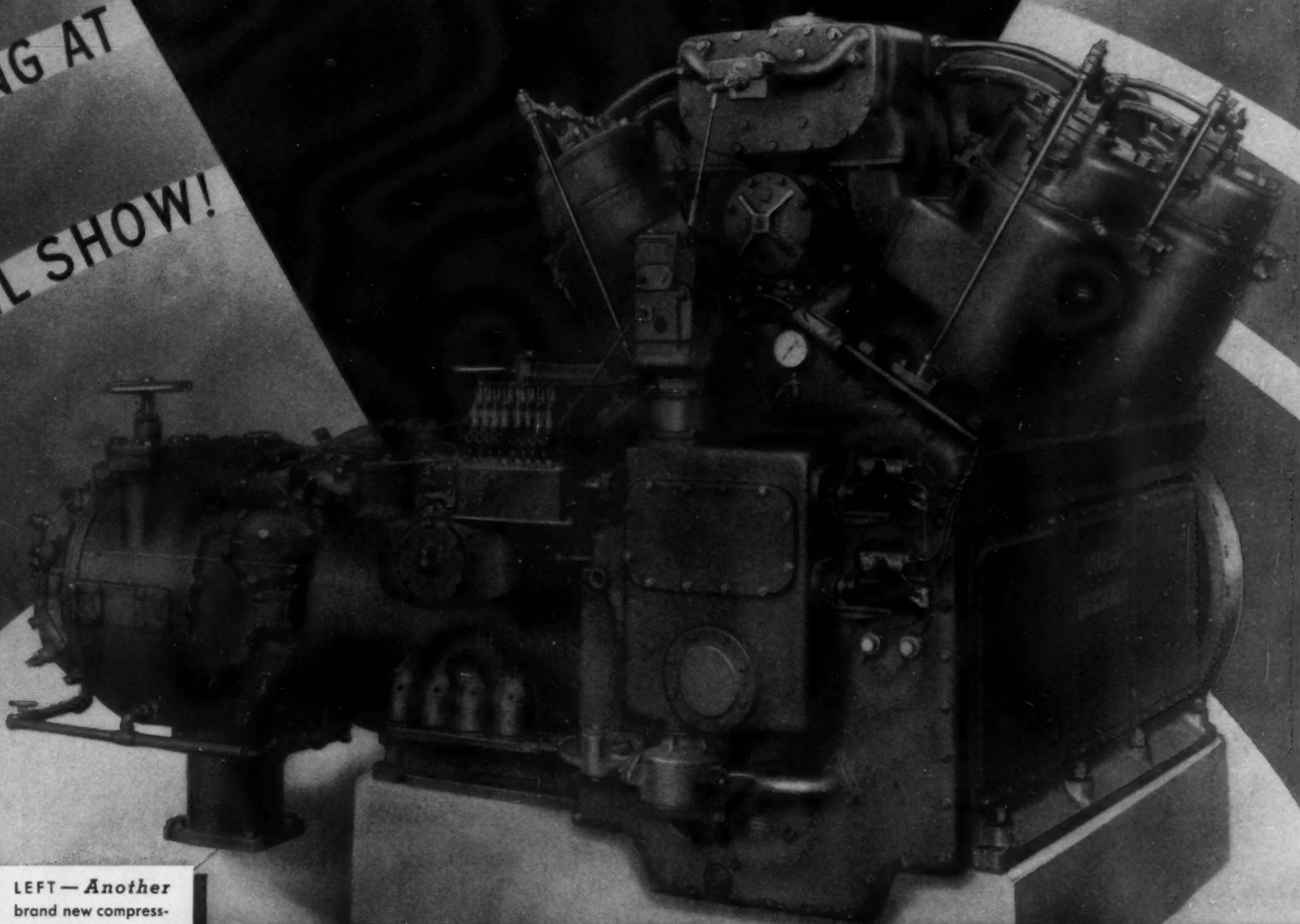
"Is it any wonder that I willingly renew my subscription to *GAS* year after year?"

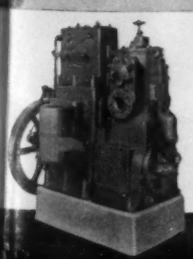
The New G-MV Compressor

Another Cooper - Bessemer Triumph!

1. LOWEST CAPITAL INVESTMENT PER HP
2. MOST HP IN SMALLEST SPACE . . . LOWEST INSTALLATION COST (CONSISTENT WITH GOOD ENGINEERING)
3. SMOOTH-RUNNING, BALANCED, V-DESIGN
4. SIMPLE 2-CYCLE, GAS-INJECTION TYPE
5. CHOICE OF 4, 6, 8, OR 10 POWER CYLINDERS
6. 400 TO 1000 HP AT CONSERVATIVE SPEEDS
7. ALL IRON CASTINGS MADE OF MEEHANITE
8. THOROUGHLY ENGINEERED BY COOPER-BESSEMER

SEE IT RUNNING AT THE OIL SHOW!





LEFT — *Another* brand new compressor unit at the show ... Type G-MSI Two-cycle, 40-50 hp. Self-contained. Combines vertical gas engine with compressor. Convertible for oil fuel.

THE COOPER-BESSEMER CORPORATION

640 EAST 61st STREET . . . LOS ANGELES, CALIFORNIA

25 West 43rd Street, New York City
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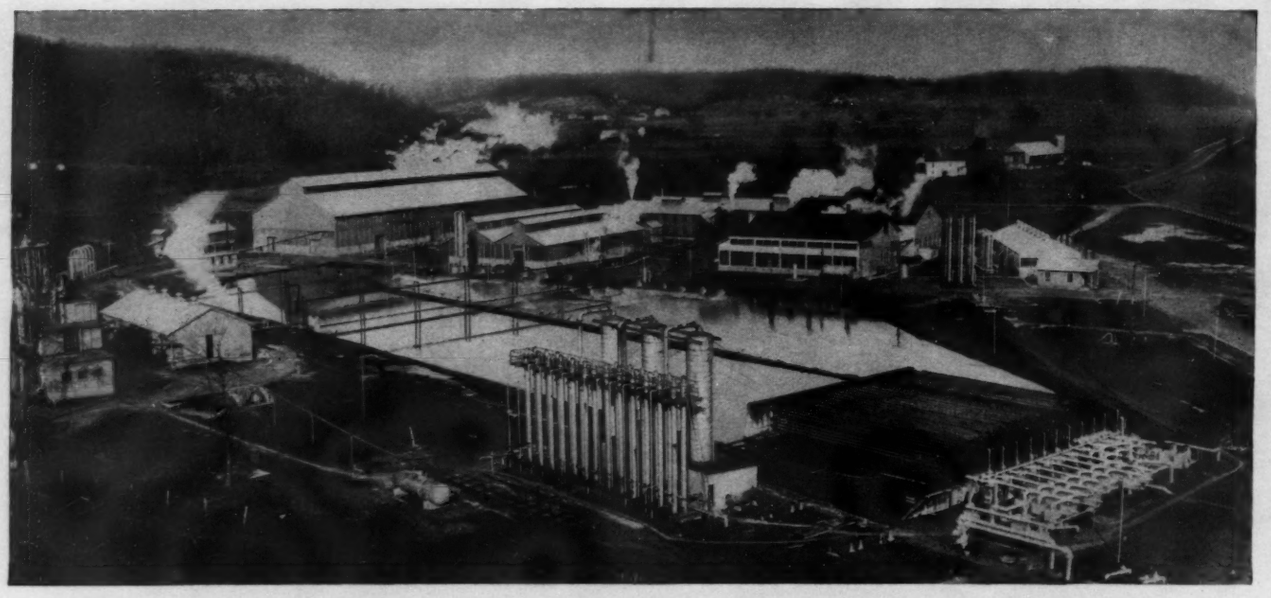
Mills Building, Washington, D. C.
631 Spring Street, Shreveport, La.
201 East 1st Street, Tulsa, Okla.
Esperson Building, Houston, Texas
Mount Vernon, Ohio — PLANTS — Grove City, Pennsylvania

105 YEARS OF KEEPING PACE WITH INDUSTRY



Crawford Compressor Station of the Ohio Fuel Gas Company at Sugar Grove, Ohio . . largest in the world. It is one of the 104 Columbia compressor stations with a combined capacity of 209,911 h.p.

MEETING THE GAS NEEDS OF A HIGHLY DIVERSIFIED MARKET

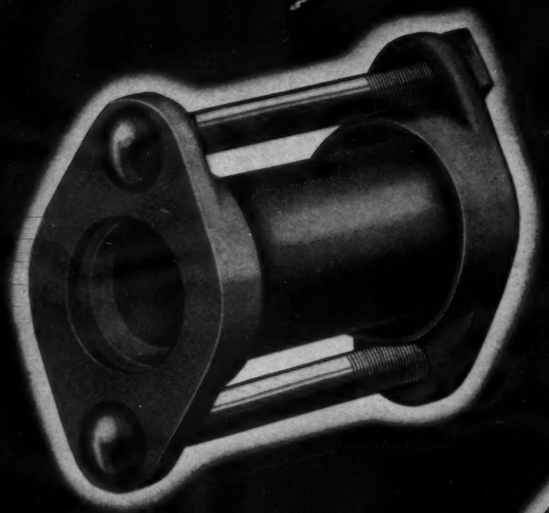
THE service territory of Columbia System is a populous area comprising adjacent sections of Ohio, Indiana, Kentucky, West Virginia, Virginia, Maryland, Pennsylvania and New York. To that large market gas is made readily available for the varied requirements of industry as well as commercial and residential purposes. Continuing demand for this dependable and economical fuel tends greatly to widen the scope of its usefulness.

At the end of 1937, operating companies of the System were serving directly, through more than 30,000 miles of gas pipe lines, 1,102,491 gas customers in 1,491 communities with a total population exceeding 5,000,000. During the year, gas sales amounted to 147,524,469 mcf. Normal business expansion, growth in population, ever widening use of time and labor saving appliances . . factors characteristic of our national progress . . should increase this volume.

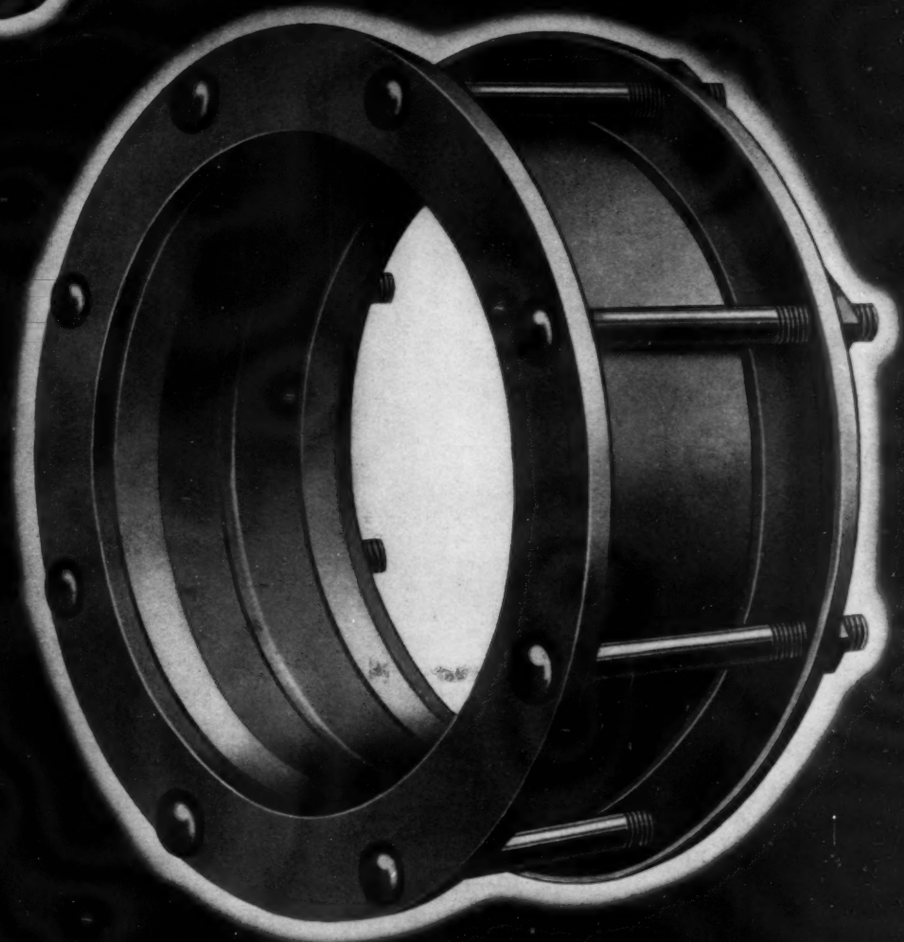
COLUMBIA SYSTEM

COLUMBIA GAS & ELECTRIC CORPORATION

DAYTON....



Sizes ½" to 2" I. D.—Malleable Flanges—Seamless Steel Centers—Incomparable for service lines.



Sizes 6⅝" to 24" O. D. Steel Flanges—Electrically welded Centers—Constructed in anticipation of future pipe line requirements.

..No. 1 COUPLINGS

THE NATIONAL SUPPLY COMPANY
(DAYTON COUPLING DIVISION)
TOLEDO, OHIO, U. S. A.

WATER is indispensable to human existence—cast iron pipe is indispensable to long life and economy in an underground main—nothing takes their place. Great progress has been made in the purification and distribution of water supply, as well as in the manufacture of cast iron pipe.

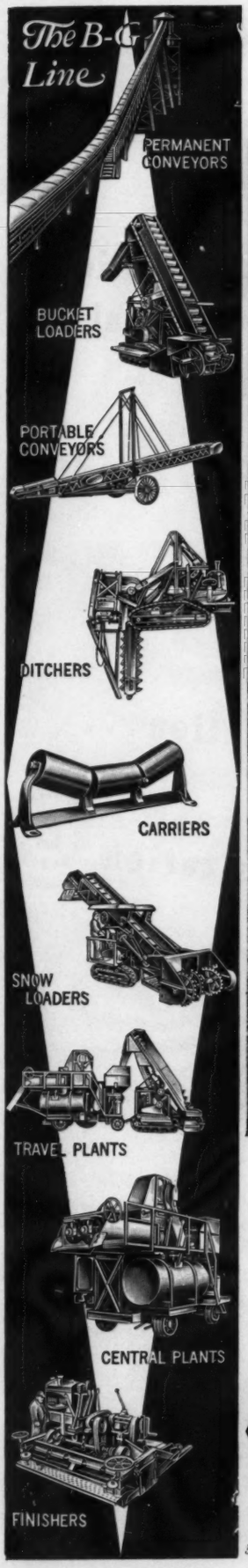
If you demand *proved* long life and low maintenance cost that result from effective resistance to corrosion — assured safety margins for impact, beam load and crushing stresses—and permanently tight joints—then you will agree that *nothing takes the place of cast iron pipe.* Some materials meet some of these requirements but only cast iron pipe meets them all.

Look for the "Q-Check" registered trade mark.
Cast iron pipe is made in diameters from 1¼ to 84 inches.

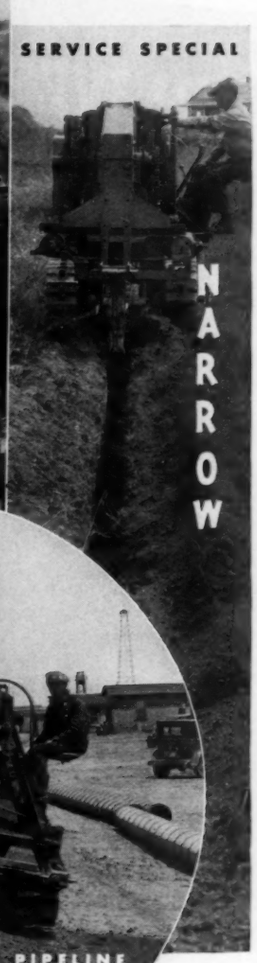
THE STANDARD MATERIAL FOR UNDERGROUND MAINS

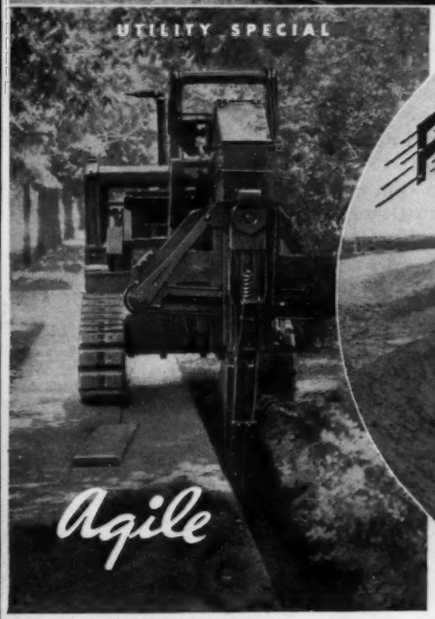
Installing 30-inch plain end cast iron pipe for a gas main under one of Chicago's busiest streets. Cast iron pipe with gas-tight mechanical joints meets any modern operating requirement.

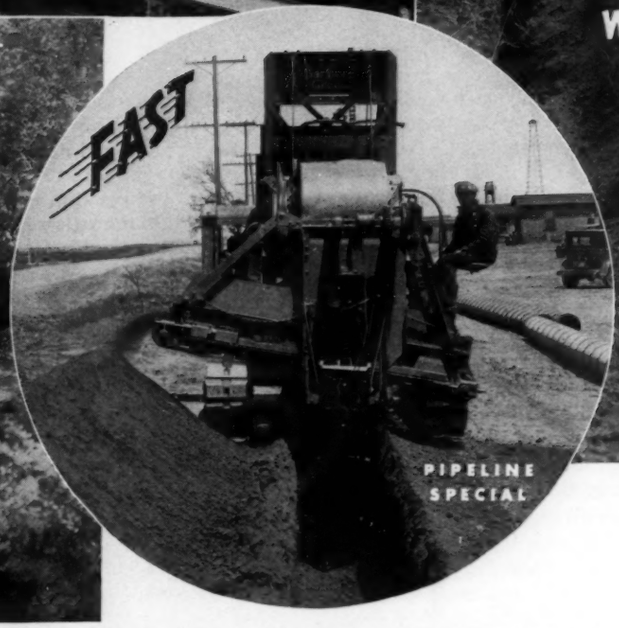
THE CAST IRON PIPE RESEARCH ASSOCIATION, THOMAS F. WOLFE, RESEARCH ENGINEER, 1013 PEOPLES GAS BUILDING, CHICAGO, ILLINOIS



4 Barber-Greenes







The same exclusive basic design applies to all B-G Ditchers. They have demonstrated their milling ability through Florida's coral rock. The self-cleaning buckets have proven themselves in the stickiest gumbo, and the records set by B-G's in the oil fields show dependability and speed that insures profitable ditching.

All four Barber-Greene Ditchers have the Patented Vertical Boom that digs straight down, the Automatic Overload Release that protects the machine and underground pipe, Self-Cleaning Buckets, Milling Action Digging, and full Crawler Mounted Maneuverability.

The Standard 44-C digs down to 8'3" deep. The Pipe Line Special has the extra speed that pays real dividends in mile after mile of ditching. The Utility Special has the B-G Off-Set boom that digs up close to obstructions on either side. And the Service Special is so narrow and compact it pays for itself on jobs as small as service connections. Write for literature today, there is no obligation.

Standardized Material Handling Machines

BARBER GREENE

715 West Park Avenue
Aurora, Illinois

37-7

UNIVERSAL GEARED TO MEET THE BASIC REQUIREMENTS OF THE GAS INDUSTRY!

Consumer appreciation of gas as the ideal cooking fuel . . .

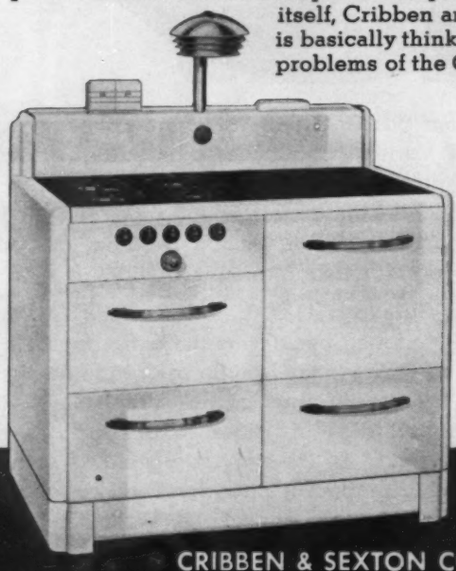
Sales Promotion . . .

Sales Organization . . .

Universal Gas Range Line

Modern Styling plus Advanced Devices . . .

Cribben and Sexton Company offers the gas utility company more than just another line of gas ranges. The Universal line, as well as Universal promotion plans, are primarily designed to meet the particular needs and requirements of the Gas Industry. ¶ It is a certainty that the gas service is only as modern as the gas range, and the devices incorporated in the Universal make it a range that promotes the superiority of Gas as the ideal cooking fuel. In addition, the Universal sales organization knows and understands the basic problems of the gas utility company, and is in a position to be of service from the standpoint of helping to plan utility sales promotion as well as aiding in employee education. ¶ The sales and promotion materials are also created to fit into the utility picture. They are designed to assist in educating the consumer as to the true merits of the modern gas range and as an aid to the utility salesman in properly presenting the modern range to the consumer. ¶ Thus throughout every phase of the Universal sales promotion plan, as well as the line itself, Cribben and Sexton Company is basically thinking of the particular problems of the Gas Utility Industry.



The devices incorporated in Universal Gas Ranges make possible a more simple, a more certain, and a more time-releasing cooking service. It is the key to cooking modernization as well as kitchen modernization.

Universal Gas Ranges

CRIBBEN & SEXTON COMPANY • 700 N. SACRAMENTO BLVD. • CHICAGO

GAS
May, 1938

Guest Editorial

Forward NATURAL GAS!

By ROBERT W. HENDEE

Chairman, Natural Gas Department,
American Gas Association

IN SPITE of the general financial and mental depression which has crept over the country, and, for that matter, throughout the world as a whole, the outlook for the natural gas industry is—*forward.*

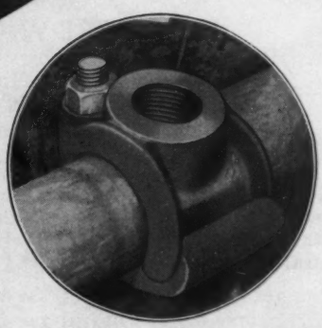
The year 1937 was one of the best, if not the very best, in the history of the natural gas industry. In checking over statistics for all companies it is evident that not only were sales of gas and revenue from those sales at a peak, but merchandise and all other related sales reached the highest point in volume and in dollars in the history of the business.

But even better than these facts, which are easily discernible, are the intangible elements which saw their inception in the last few years, and which are certain to have a stabilizing effect on the natural gas business taken as a whole. Reference is made to the activities of the American Gas Association in the National Advertising Campaign, the C-P Range Program and the cooperative program with the National Housing Bureau. A further excellent selling program is that being sponsored by the maker of the gas refrigerator. These are factors which have gained impetus enough to carry the business on and through a depression of some length. In other words, the curve representing the index for the natural gas industry for the year 1937 was decidedly on the upgrade. Unfortunately the combined efforts of the weatherman and industrial layoffs created havoc with most of the companies for the first two months of 1938. But in the above campaigns there is an opportunity for the gas industry which does not exist in other industries. They are very timely hedges against an otherwise static year. It is felt that proper cooperation with these programs will develop enough new business to carry many companies satisfactorily through the year 1938.

Most highly paid writers of financial news and prognosticators of the future trends, who delve into indices as their crystal gazing ball, predict that the usual up-swing of business which has occurred for spring after spring will be a straight line this year and that there will be no improvement in business at least until fall. But—they further foresee that if there is one good and probably successful experiment emanating from Washington, it is the revamped Federal Housing Act. Great stress has been laid on the value of this act to industry and for home owners over the entire length and breadth of the country. Not only does this act provide for new construction, for which, in certain sections, there is a decided demand, but it places great emphasis upon the remodeling of the millions of old homes. In 99 cases out of a hundred a remodeling job means a new central heating system, a new automatic hot water heater, a new gas refrigerator, or at least a modern cook stove. What industry has a better opportunity of getting behind the ramifications of this act and reaping tremendously therefrom? But it is going to mean work and more work, added to cooperation with the Housing Administration, architects and builders to see that heating, hot water heating, cooking and refrigeration are done the natural gas way, and then that proper and satisfactory installations are made.

Yes! it is going to take work; but this writer feels that a proper follow-up of this Housing Act, together with the results of the advertising campaign and the entrance of the new and glorified gas ranges on the market are going, in spite of everything, to mean—*forward natural gas.*

SKINNER SERVICE SADDLES make tight, rigid, lasting service connections . . . QUICKLY!



Above: **SKINNER SERVICE SADDLE. Note simplicity and strength!**

Right: **as installed on line.**

The only saddle having skids on lower half to absorb all movement when bolt pressure is applied — thus preventing tilting at the tap. SKINNER SERVICE SADDLES are widely used for service connections. Made of malleable iron with cadmium plated steel bolt. Lead gasket is riveted in place. Single large bolt saves time in application, and gives a uniform seating to the gasket. Each saddle accurately formed over a mandrel, then given a 50 lb. air-and-soap test before shipping. Write for prices, and complete catalog.

SKINNER SADDLE TEE, (at right) for installing gas appliances. No pipe cutting — no threading. Complete job in 3 minutes. Easily applied anywhere. Standard with hundreds of gas companies for installing Electrolux and other equipment. Write for prices.

M. B. SKINNER CO. *Est. 1898* SOUTH BEND, IND.

GAS

FOURTEENTH YEAR OF PUBLICATION

Thermally Thinking

By Stanley Jenks

Looking Forward It is not hard to agree with our last month's Guest Editor, R. E. Fisher, vice-president of the Pacific Gas and Electric Co., in being optimistic about the future of the Natural Gas Industry, in the light of the fundamental facts.

Today, natural gas is a basic industry, thanks to the investors whose money made it possible, the engineers whose technique and skill made it available, and the thousands of loyal men and women whose efforts make this perfect fuel practical, and a necessity in the lives of millions of our fellow citizens. The Natural Gas Industry must be, and will continue to be, because none can replace it at like cost or value to its customers.

It would be futile, of course, to ignore the external and internal shadows that cloud the immediate situation; but, as in industry generally, it would be equally foolish to consider these problems beyond satisfactory solution. Mounting operating costs and the downward trend of rates are factors that cannot be ignored, and demand urgent attention. The industry must operate profitably to survive. Without favorable balance sheets, it cannot hope to atract new capital to finance its development and extension.

It is told of General Booth, founder of the Salvation Army, that he was once accused of using irreligious music for his hymns. "Why should the devil have all the best tunes?" replied the general. In this instance, we, and not our fuel competitors have the best tunes, but the other lads sing louder than we do. They out-man us in the fuel market. Perhaps, as an immediate improvement measure, we should double, triple or even quadruple our sales forces, and by sheer weight of increased sales activity, make this our major step along "The Road Back" as advocated so convincingly by Hall Henry at Cleveland last Fall.

A Picture in Oils Chief Engineer Alfred Johnson of Combustion Utilities Corp., combines a rare knowledge of the gas and oil businesses. Recently, we were trying to read the Gas Industry horoscope, and these are some of the figures that Mr. Johnson brought into the discussion. They are general, but I feel, of much interest to gas men. According to Mr. Johnson, the manufactured gas industry uses a mere 12,000,000 barrels of oil yearly. Almost twice this amount, or 23,000,000 barrels, is sold by the oil people themselves for cooking and heating stoves and other direct uses. But these are chicken feed figures, when we learn that 69,000,000 barrels of oil last year were used through central heating oil burners in these United States. Someday that latter load will be ours, and the sooner we appreciate its significance, the value of our advantages over their disadvantages, and set the old gray matter to doing something about it, the sooner we'll be approaching the Industry's goal, which is to be the nation's fuel bin.

Plain Speaking The kilowatt coo-kooery lads with their soapstone and haywire contraptions must be getting little consolation out of a recent announcement by one of the metropolitan New York combination companies.

"There is a great deal of present interest in cooking by electricity and occasionally our customers ask us as to its merits," states the Queens Borough Gas & Electric Co., Far Rockaway, N. Y.

"We as a combination company sell both gas and electricity and take an impartial view of their comparative merits for cooking. We are prepared to supply service for either. We approach the question from one angle only—what is best for the customer. We believe that what is best for the customer should prevail, and that what is best for the customer is best for the Company.

"At the present time the customer's dollar buys more heat value and more cooking satisfaction in gas. On the score of speed, flexibility, appliance and repair costs, the present advantage lies with gas. We believe the improvements that are constantly being made in gas appliances both in appearance and in efficiency, will serve to increase our customers' satisfaction in their use. With these facts in mind we recommend gas for cooking."

'Nuff sed.

Purdue Report

In the recent engineering bulletin on "Automatic Gas-fired Storage Water Heaters" published by Purdue University, and authored by J. M. Krappe, Associate in Gas Engineering, there is one conclusion that might be too readily dismissed as being so obvious as to broach the bromidic. It is that the cost of heating water by gas is considerably less than most people realize. Right! And it goes for far too many people inside the industry, especially in manufactured gas circles.

Many moons have waned since bill adjustment clerks advised people that it must be the automatic gas water heater that was responsible for the high gas bill, or when top executives were bawling the tar out of their hapless sales people for not selling more automatic water heaters, while they, themselves, were using other fuels for water-heating. The memories of the days of flat non-promotional rates when you installed an automatic water heater in your home and from then on furtively dodged the sheriff, are remote, but alas! those self-same memories linger on in the minds of many, who are blind to progress and change. "The evil that men do lives after them," said Marc Antony at the bier of the murdered Caesar. The evil of early expensive water heating costs has had a similar fate. The dog got a bad name years ago, and there are many hanging him today.

It is no exaggeration to say that the average gas storage water heater is at least 25.0 per cent more efficient today than it was as little as 10 years ago. We can thank our manufacturers and gas utilization engineers for that.

Again it is no exaggeration, thanks to the progressive adoption of promotional rates throughout the industry, to claim that the cost of gas for water-heating has been reduced generally, at least 25.0 per cent. With lower fuel costs and increased thermal efficiencies, the Purdue conclusion is more than a statement of truth. It is a challenge that cannot be ignored. In practice it represents a sales barrier to be climbed, and wholehearted co-operation in the 1938 Water Heater Sales Contest, sponsored by the A.G.A. and A.G.A.E.M. strikes me as being the best effective and aggressive way of uprooting the inborn misunderstanding that unfortunately still exists on the real costs of gas automatic water heating.

Cold from Heat

Mrs. Ellis Alyce Lytle, home service director of the Consolidated Gas, Electric, Light and Power Co. of Baltimore Md., lives and learns. The boys were having an awful lot of trouble with one gas refrigeration customer. Do what they could, the bills were way out of line. Investigation showed the burner was adjusted perfectly, and there was no excessive usage by the customer. Finally Mrs. Lytle and a salesman went out to give the case personal study.

They found the colored laundress ironing away in the kitchen, one end of the ironing board resting on the shelf of the gas refrigerator. Asked if she usually ironed in this manner, the culprit replied, "Ah suah does. An' Ah don' know what Ah'd have done without this yere ice box in this hot kitchen."

There seem to be no limits to the available comforts from gas service.

The Meetings This Month

The Month of May is the time when gas industry executives make the most of every opportunity to get together with their colleagues from other sections of the country for exchange of ideas that may increase the efficiency and breadth of the industry's service. Heading the month's activities is the Annual Convention of the American Gas Association's Natural Gas Department. There is no need to dwell at length upon this meeting, as a resume of what will take place in New Orleans between May 9 and May 12 appears on the page opposite.

Worthy of special mention, however, is the first annual convention of the Association of Gas Appliance and Equipment Manufacturers, which convenes May 25 at White Sulphur Springs, West Virginia. The meeting is significant in that it brings into even closer conjunction the promotional activities of the utilities and the gas appliance manufacturers, and a greater portion of the sessions will be devoted to reviewing and discussing the various A.G.A.E.M.-sponsored gas appliance sales campaigns. Featured speaker at the closing session of the convention will be Bruce Barton, representative from New York, who, by his one-man campaign to rid the nation of ineffective and obsolete laws, has attracted wide attention.

Another meeting of importance will be the 28th Annual Convention of the Indiana Gas Association which meets in Gary, May 15-17. Association executives have arranged a profitable program on a wide variety of topics currently holding the industry's attention.

Direct Space Heating Load

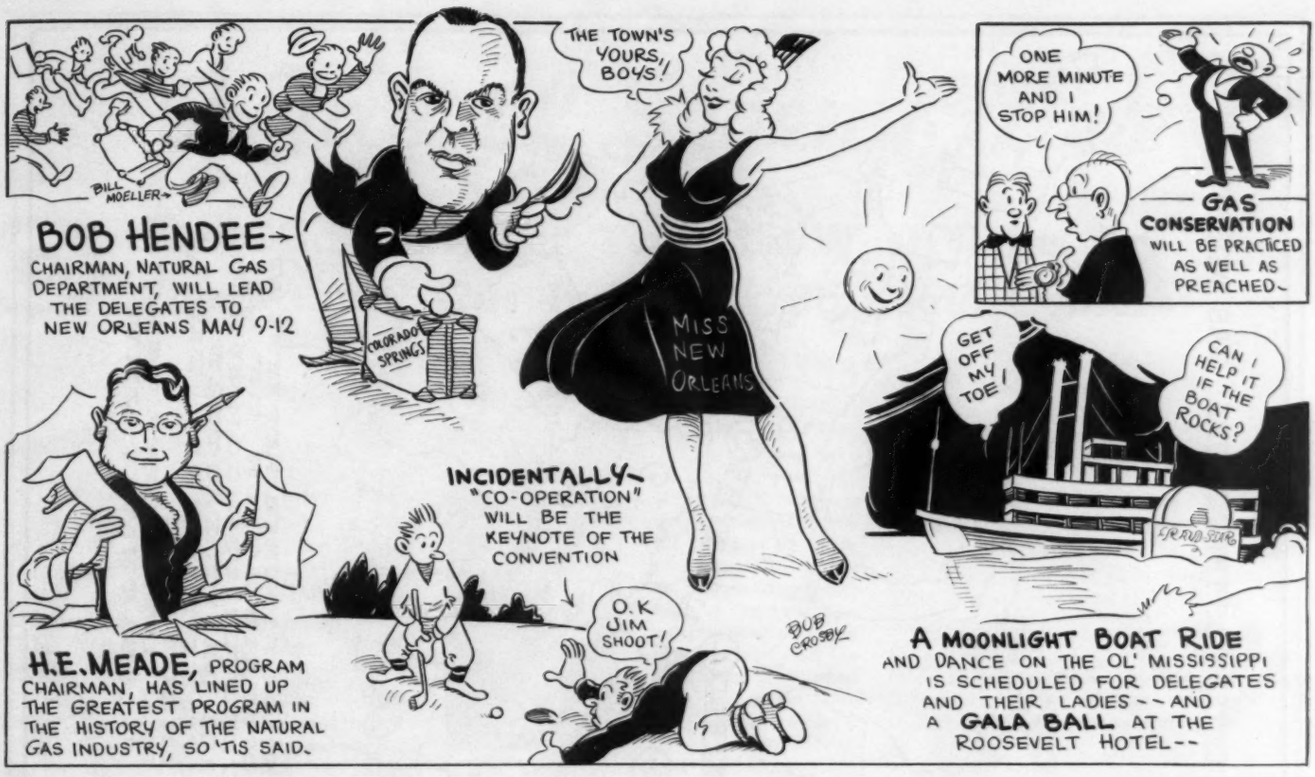
Here I am, hit for two bases before I hardly have had time to get warmed up. The hitter is my erstwhile Newark Nemesis, Dick Cleary of Homestead Heater Co. and chairman of the Direct Heating Equipment Section of the A.G.A.E.M.

First, I called them "auxiliary space" heaters. The modern and better name is "direct" heaters.

Dick's next point is more controversial. You remember last month, I listed the annual load credits of appliances, as used by a gas company I know. I credited the direct heater with 12 therms annually. I'll let Mr. Cleary speak for himself. He writes:

> "The load value assigned in that schedule to auxiliary space heaters (or, as we prefer to have them called, 'direct' heaters) is entirely too conservative.
>
> "Even in manufactured gas territories the figure is a little hard to take and in most natural gas territories the direct heater is usually admitted to account for as much of the domestic customer's gas dollar as the gas range.
>
> "In 1929, J. K. Swanson, Minneapolis Gas Light Co., under 'Domestic uses other than cooking' rates space heaters in a manufactured gas territory at a 6,000 B.t.u. load factor against 18,600 B.t.u. for refrigerators. (See A.G.A. 1929 Reports—pp. 452-457).
>
> "I do not have any other definite figures available at the minute, but that tabulation again makes the direct heater a step-child of the industry. Actually, direct heaters turn on a bigger dollar for gas in proportion to the appliance cost to the customer and the sales cost to the utility than any other domestic gas appliance."

Always glad to be sorry, or was I as wrong as Dick Cleary claims me to be? What is your experience?


BILL MOELLER
BOB HENDEE
CHAIRMAN, NATURAL GAS DEPARTMENT, WILL LEAD THE DELEGATES TO NEW ORLEANS MAY 9-12
COLORADO SPRINGS
THE TOWN'S YOURS, BOYS!
MISS NEW ORLEANS
ONE MORE MINUTE AND I STOP HIM!
GAS CONSERVATION WILL BE PRACTICED AS WELL AS PREACHED.
GET OFF MY TOE!
CAN I HELP IT IF THE BOAT ROCKS?
INCIDENTALLY— "CO-OPERATION" WILL BE THE KEYNOTE OF THE CONVENTION
O.K JIM SHOOT!
BOB CROSBY
H.E. MEADE, PROGRAM CHAIRMAN, HAS LINED UP THE GREATEST PROGRAM IN THE HISTORY OF THE NATURAL GAS INDUSTRY, SO 'TIS SAID.
A MOONLIGHT BOAT RIDE AND DANCE ON THE OL' MISSISSIPPI IS SCHEDULED FOR DELEGATES AND THEIR LADIES--AND A GALA BALL AT THE ROOSEVELT HOTEL--

On to New Orleans

FOUR interest-packed days of profit and pleasure await those members of the natural gas fraternity, who are even as this book goes to press preparing for the journey to New Orleans to attend the 1938 Natural Gas Department Convention of the American Gas Association, on May 9-12. The convention program will be a dramatic presentation of natural gas service from the producing sand to the consumer's burner tip, according to word received from T. Holley Joe, secretary of the Department.

Nationally known speakers will feature the general sessions, which will be presided over by Robert W. Hendee, Colorado Springs, Colo., and Thomas W. Weymouth, New York City, president and vice-president respectively of the Department. H. E. Meade, New Orleans, chairman of the Program Committee, has prepared a constructive and all-inclusive sequence of events.

Chairman Hendee will open the General Sessions with an address on "The Future of the Natural Gas Industry." Prominent places on the program are assigned to N. C. McGowen of Shreveport, La., president of the American Gas Association; to Merrill N. Davis of Bradford, Pa., president of the Association of Gas Appliance and Equipment Manufacturers; and to J. D. Creveling of New York, who will speak on "Natural Gas at the World's Fair." Other timely addresses will be given by Alexander Mahood, president of the National Association of Railroad and Utility Commissioners, Charleston, W. Va. and by Cecil F. Elmes of Sanderson and Porter, New York.

Of wide interest will be an address on "The Gas Industry's Stake in Air Conditioning," by L. R. Boulware, vice president and general manager, Carrier Corp., Syracuse, N. Y. Prominent in the discussion of sales topics will be papers by Franklin T. Rainey, The Ohio Fuel Gas Co., Columbus, Ohio; J. Woodward Martin, Lone Star Gas Co., Dallas, Texas; Henry M. Heyn, Surface Combustion Corp., Toledo, Ohio, and a Home Service Symposium, conducted by Mildred Clark, of the Oklahoma Natural Gas Co., Tulsa, chairman of the A.G.A. Home Service Committee.

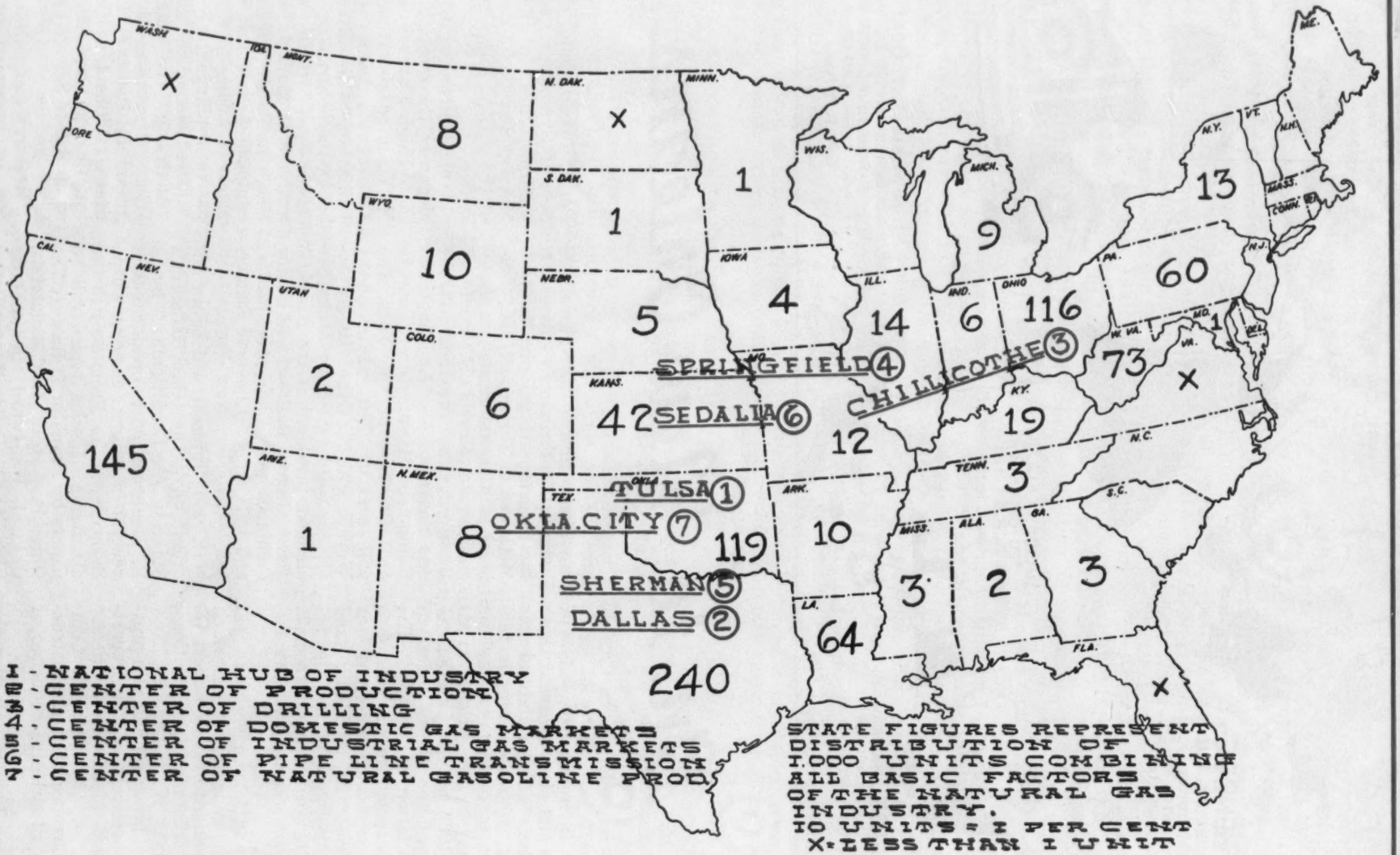
"Our Job is a Selling Job" is the slogan of the meeting, and Chairman Hugh Cuthrell of Brooklyn, N. Y., in collaboration with members of the Domestic Sales and Utilization Committee, has developed a program on sales of domestic gas which will include analyses of markets, sales promotion, national advertising, gas equipped homes and every other phase of selling and utilization of gas in dwellings.

Listed among the addresses are "Analyzing the Mass Market When Organizing a Sales Program," by Henry O. Loebell, Natural Gas Pine Line Co. of America, Chicago, and "Home Service as an Aid to Sales," by Mildred R. Clark.

Research and technical problems will be presented by the Main

(Continued on Page 42)

FIG. 1. MAP OF THE UNITED STATES SHOWING THE SEVEN CENTERS OF THE NATURAL GAS INDUSTRY



A Tale of Seven Cities

Five Mid-Continent; Two Mid-West Cities Are The Natural Gas Industry's Strategic Centers

By H. J. STRUTH
Petroleum Economist, Dallas Texas

JUST as the spokes of a wheel converge to form its hub, in like manner basic structures which combine to form the natural gas industry also converge at one central point which definitely establishes Tulsa, Oklahoma, the hub of the greater natural gas industry.

Far from being "Chamber of Commerce" propaganda, the establishment of Tulsa and other specific centers of the natural gas industry are the result of mathematical calculations. In the accompanying map, Fig. 1, are shown seven important centers of the natural gas industry. A combination of all basic factors of the industry, represented by 1,000 units, has been distributed over the various states as shown by the uncircled numbers. An equal division of these units, from East to West and from North to South, causes an intersection of a horizontal and a vertical line at a point occupied by the city of Tulsa, Okla.

H. J. STRUTH

MR. STRUTH, who has been associated with the gas and oil industries since 1917, has for the past two years been in charge of economic research and public relations for the Mid-Continent Oil and Gas Association, Dallas, Texas. He is a former editor of Natural Gas Magazine, which was published in Cincinnati, Ohio, under the auspices of the American Gas Association.—Editor.

Dallas, Texas, is the true center of natural gas production in the United States, by reason of the fact that a similar distribution of gas production units results in an intersection at that point. Chillicothe, Ohio, is the center of drilling and gas field development. This is due largely to the fact that gas well completions in the Eastern sector far outnumber those west of the Mississippi River. And, because the combined production of gas wells east of the Mississippi only constitute about 15 per cent of the national total, the centers of drilling activity and natural gas production are widely separated. Springfield, Ill., is the true center of domestic gas markets, forming the hub of an area wherein 65 per cent of the nation's natural gas used for domestic and commercial heating is marketed. The cross roads of industrial natural gas markets intersect at Sherman, Texas, near the Oklahoma border. The area surrounding this point utilizes 66 per cent of all the

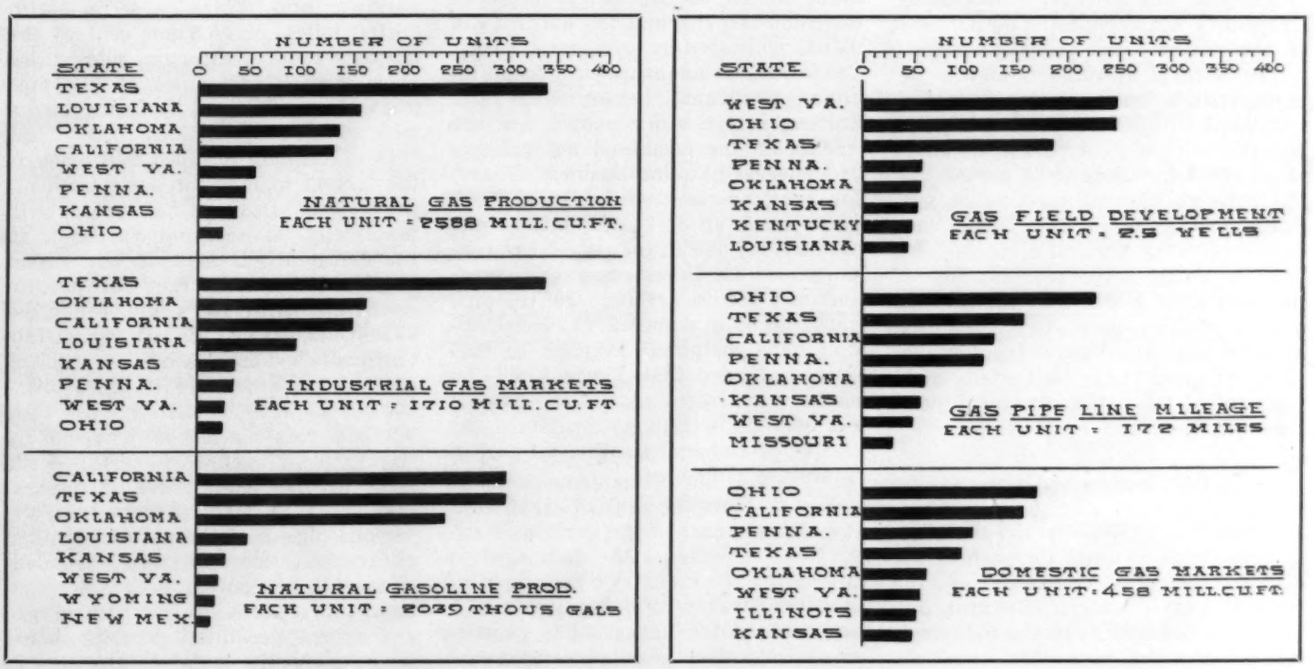


FIG. 2. Charts showing rankings of the eight leading states in the six classifications of data used in computing the industry's geographical center.

TABLE NO. 1. UNIT DISTRIBUTION OF THE NATURAL GAS INDUSTRY

(Compiled from 1937 Data)

State	Natural Gas Production (Unit= 2588 MM c.f.)	Gas Wells Drilled (Unit= 2.5 wells)	Domestic Gas Consumed (Unit= 458 MM c.f.)	Industrial Gas Consumed (Unit= 1710 MM c.f.)	Pipe Line Mileage (Unit= 172 miles)	Natural Gasoline Production (Unit= 2039 thous. gals.)	Total Units	Weight. Average
Ala.	—	—	3	5	6	—	14	2
Ariz.	—	—	1	3	5	—	9	1
Ark.	2	1	18	13	19	6	59	10
Calif.	131	6	157	150	128	300	872	145
Colo.	3	×	11	9	11	3	37	6
Fla.	—	—	×	×	—	—	×	×
Ga.	—	—	9	1	8	—	18	3
Ill.	1	2	51	18	6	8	86	14
Ind.	1	13	5	8	8	—	35	6
Iowa	—	—	9	9	9	—	27	4
Kan.	37	51	48	34	56	27	253	42
Ky.	19	47	25	3	17	2	113	19
La.	156	41	26	95	20	48	386	64
Md.	—	—	7	×	—	—	7	1
Mich.	14	25	3	1	2	7	52	9
Minn.	—	—	3	4	2	—	9	1
Miss.	—	—	6	3	8	—	17	3
Mo.	—	—	32	12	29	—	73	12
Mont.	10	10	16	5	9	×	50	8
Neb.	—	—	9	7	13	—	29	5
N. M.	8	11	3	10	4	11	47	8
N. Y.	4	6	42	11	16	×	79	13
N. D.	—	—	—	×	1	—	1	×
Ohio	21	244	169	22	225	5	696	116
Okla.	136	55	61	162	60	237	711	119
Pa.	44	56	108	33	116	6	363	60
S. D.	—	—	4	2	1	—	7	1
Tenn.	—	—	9	4	5	—	18	3
Tex.	345	182	96	339	155	300	1417	240
Utah	—	—	6	3	4	—	13	2
Va.	—	—	2	—	—	—	2	×
Wash.	—	—	—	1	×	—	1	×
W. Va.	54	246	54	23	49	23	439	73
Wyo.	14	4	7	10	8	17	60	10
Total Units	1000	1000	1000	1000	1000	1000	6000	1000

natural gas consumed for industrial purposes. Sedalia, Mo., is the center of gas pipe line mileage, embraced by a territory which contains 56 per cent of the nation's gas trunk lines.

The natural gasoline industry, integral with natural gas, is centered at Oklahoma City, Okla. From this point one may within a comparatively small circle reach upwards of 63 per cent of the nation's natural gasoline output. Large production in the Texas Panhandle pulls the vertical division point west of Tulsa, while the influence of production in North and East Texas and Louisiana pulls the horizontal division point southward. Incidentally, California and Texas each produced 30 per cent of the nation's natural gasoline output in 1937.

Distribution of Units

Table No. 1 presents the distribution to states of units for each of the six fundamental functions of the natural gas industry. The unit distribution is based upon the industry's figures for the year 1937, each 10 units being equivalent to one per cent. The combination of 6,000 units, averaged to form the industry's composite index shown on the map, represents the combined share of the natural gas industry enjoyed by each state. Texas, California, Oklahoma, Ohio, West Virginia, Louisiana, Pennsylvania and Kansas, in the order named, are the leaders of the combined natural gas and natural gasoline business. Texas, for example, is credited with 1,417 units, made up of 345 in natural gas production; 339 in industrial gas consumption; 300 in natural gasoline production; 182 in drilling; 155 in pipe lines and 96 in domestic gas consumption. The weighted average of 240 units indicates that Texas leads the nation with 24 per cent of the natural gas business within its own state, exclusive of gas and gasoline shipped in interstate commerce.

Fig. 2 shows the rank of eight leading states in each of the various classifications comprising the data used in computing the industry's geographical centers. Texas, with 345 units, or 34.5 per cent of the nation's gas production, ranks first in this classification. Since each unit equals 2,588,000,000 cu. ft., the state's total production last year amounted to 891,700,000,000 cu. ft. Louisiana, with less than one-half of Texas' output, attained second place during the past year.

Texas also leads the nation in the quantity of industrial natural gas consumption. Factors which contribute to Texas' lead in this classification are a heavy demand for gas by its numerous oil refineries and the utilization of large quantities of gas in the manufacture of natural gasoline and carbon black. Texas uses 33.9 per cent of all the natural gas utilized for industrial purposes. Industrial gas consumption in Texas last year aggregated nearly 580,000,000,000 cu. ft.

California and Texas vied for first place in the natural gasoline industry, each contributing 300 units, or 30 per cent of the nation's output last year. Texas produced 611,800,000,000 gals., while California output aggregated 612,500,000,000 gals., a slight lead over Texas in gallonage produced. Oklahoma ranked third place with 237 units, producing 486,700,000,000 gals. in 1937.

Largest Producing States

While Texas is the largest natural gas producing state, West Virginia and Ohio hold the lead in number of gas wells drilled. Last year, the latter two states drilled 623 and 618 gas wells, respectively, while Texas was in third place with the completion of 456 gas wells.

Ohio leads the nation in mileage of gas transmission lines, with a total of 38,100 miles, 22.5 per cent of the nation's total. Texas is second with 26,700 miles, or 15.5 per cent of the nation's total. California holds third place with 22,000 miles of gas pipe lines, closely followed by Pennsylvania with 20,000 miles of lines.

Ohio has long retained first place as the largest market for domestic heating with natural gas. California, with practically no seasonal variation in the domestic gas load, is the second largest domestic market for natural gas. Ohio, with 169 units, consumed 77,000,000,000 cu. ft. last year while California's domestic consumption of natural gas amounted to 72,000,000,000 cu. ft.

While this discussion is decidedly "figurative," it sets forth certain basic facts which should prove of interest and value to many engaged in the various phases of the natural gas and natural gasoline industries. The definite establishment of geographic and strategic centers of the natural gas and natural gasoline industries should prove decidedly useful to gas men in the study of market expansion.

A Chicago Utility Surveys 7,358 Gas House Heating Customers; Finds 96 per cent Are Satisfied

By B. A. JOHNSON
Manager, Sales Engineering
The Peoples Gas Light and Coke Co.

ONE of the regular staff meetings of The Peoples Gas Light and Coke Company's Domestic Sales Department was about to get under way.

"Understand they're going to announce the figures on the Gas Heat Customer Survey today," one of the staff members said.

B. A. JOHNSON

"What percentage of satisfied customers do you think it will show?" he was asked.

"Oh, I'd guess 75 to 80 per cent."

"You're optimistic," a third man said, "I'd settle for 70 per cent in a survey like this one. Remember, this was no 'mutual admiration' affair. Our people encouraged the customers on whom they called to open up and be critical. . . ."

* * *

As the staff meeting got under way, the purposes and methods of the survey were reviewed before announcement of actual results.

When this call back program was inaugurated in May, 1937, it was intended to accomplish these general purposes:

1. To establish a list of satisfied users of gas on which complete information could be given to each salesman to assist him in the sale of gas heating in his territory;

2. To anticipate possible customer complaints on gas heating and apply corrective measures before the new heating season started;

3. To obtain a definite picture of customer acceptance and satisfaction with gas heat.

A survey, to yield such information, would have to be made with frankness as the keynote to get at the facts about how customers regarded gas heating after a year or more of use. Such a survey also would have to be large enough so results would accurately reflect the views of all Chicago users.

The city was divided into three general sections—north, west and south—with a minimum of 2,000 customers to be called upon in each of these three districts. This meant a minimum of 6,000 for the entire city, the actual number of calls ran up to 7,358. This total, while only a portion of the Company's central heating customers in the domestic field, is nevertheless more than adequate to reflect a true picture of conditions.

Twenty-four sales engineers were assigned to the task of calling at the several thousand homes.

On a typical visit, our representative identified himself, announced he had called to inspect the customer's gas heating equipment and then proceeded to the basement to accomplish that job.

Having come back upstairs, he engaged the customer in conversation about gas heating. He asked whether the system worked efficiently, whether it responded to weather changes, whether the family kept warm, whether the house was easy to keep clean. These questions naturally were varied in individual cases as was found necessary to get a full expression, but each interview ended with the sales engineer getting a categorical answer from the customer as to whether or not the latter was satisfied.

After the interviewer left each home, he entered the information on a standard form (See Fig. 1). The form classified customer reactions for purposes of compilation after finishing the survey. *(Continued on Page 89)*

REPORT ON GAS HEATING CALL BACK

Address_____ Date Inst._____

Name_____ Div._____

Type of Equip._____ Type Bldg._____

Estimate_____ Exceeded - Yes ☐ No ☐

Customer Satisfied With Cost: Yes ☐ No ☐ What did Customer Expect to Pay_____

Consumption: From_____ To_____ Bill $_____

Domestic_____ Net Heating_____ Per Cent Season____ Headed For_____

Customer satisfied with operation of Equip: Yes ☐ No ☐

Customer satisfied with Company Service: Yes ☐ No ☐

Customer's feeling toward Gas Heat as compared with previous fuel_____

Work recommended as result of call back _____

Call Made By_____

Date_____

OTHER APPLIANCES INSTALLED

	Type	Age	Condition
Range			
Refrigerator			
Water Heater			
Incinerator			
Furnace Coil			

FIG. 1
Standard form used to record information obtained during the call back program. Customer reactions were classified for purpose of compilation after the survey was completed.

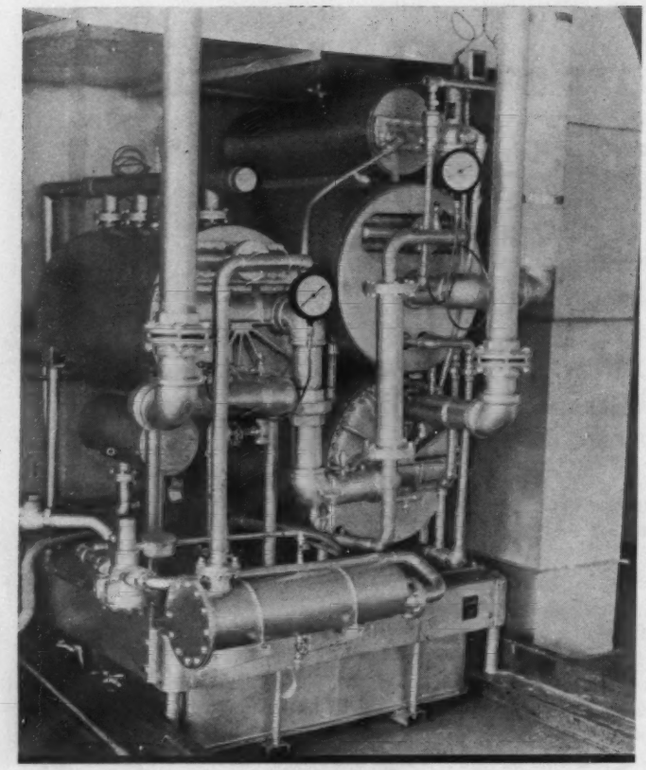


FIG. 1
Absorption refrigeration machine installed in the Pomona, Calif., office of the Southern Counties Gas Co., Los Angeles.

Summer Air

By GLEN MILLER

Southern Counties Gas Company

DURING the spring of 1937 the management of the Southern Counties Gas Co. of California became interested in the problem of gas actuated air conditioning for summer use. This interest was motivated by two causes, the possibility of summer load building and the actual need for relief from severe summer conditions in at least two of the company's district offices.

Following a course of reasoning similar to that outlined in "The Application of Gas to Summer Air Conditioning," a report of the sub-committee on Air Conditioning, Utilization Committee, Technical Section, Pacific Coast Gas Association (see *GAS*, April, 1938, p. 57), the final selection of equipment was two absorption refrigeration machines manufactured by the Williams Oil-O-Matic Heating Corp., located in Bloomington, Illinois.

Having selected this type of equipment, the first machine, a water cooled model of a nominal capacity of 15 tons of refrigeration, was ordered. Our first installation difficulty was a wait of some seven weeks for delivery of the necessary equipment while the manufacturer settled certain labor problems.

This first machine was to be installed in our Pomona office and was to be a part of a system employing either outside air cooling or refrigeration, the cooling to be applied either to an auditorium seating some 225 persons, or to the main office space in the floor below. The time interval pending the delivery of the refrigeration machine was employed in the installation of the duct work, fans, etc., necessary to the functioning of the system.

The construction of the building was such as to require considerable thought on the problem of equipment location. The structure is of reinforced concrete construction, consisting of a very small basement divided into two parts, a boiler room and a display floor; a first floor consisting of three offices, a large public space with service counter and a rear portion used for bookkeeping and the other mechanical functions of the district business; and a second floor, the front half of which is an auditorium with kitchen, stage and office with a back room used at present primarily as a recreation room. Due to the small basement and the great difficulty of getting ducts to the first and second stories and the need for all available space on the first floor, it was decided to place all of the equipment on the second floor in a portion of the back room now and then used as a recreation room. The air distribution ducts went in with no more difficulty than is ordinarily to be expected in working with an old building. We were then ready to make the installation of the refrigeration machine itself.

With the arrival of the machine we were confronted with several difficult problems. The weight of the machine (Fig. 1) was such that it could not rest directly on the second floor, as this would have caused an overloading of the building structure. This problem was solved by the construction of a spreading frame distributing the weight directly to two columns adequate to sustain the added weight of the machine. Having settled on this machine location and the proper method of support, we were faced with the necessity of supplying to the refrigeration machine approximately 100 gals. per minute of cooling water. Due to the relatively high cost of water in this locality, some form of recirculating system was deemed necessary. A number of types of recirculating water systems were considered, such as a water tower on the roof, spray pond on the roof, washer on the second floor and spray pond on the adjoining property (also owned by the company). The weight of equipment required to furnish 100 gals. per minute of cooling water eliminated consideration of all but the spray pond on the adjoining property. This problem of the weight of the cooling equipment and the weight of the water cooling equipment is one which must be met whenever the installation of an absorption machine is contemplated. The machine itself is heavier than a conventional machine and the cooling water required is about twice as great as with the conventional plant.

The cooling pond shown in Fig. 2 was constructed and flow and return lines built into the basement of the building, through the steam tunnels and up into the area set aside for the refrigeration machine. This spray pond is round, about 22 feet, effective diameter, with entrance nozzles en-

Conditioning

The Experience of One Company With Two Installations for Branch Office Comfort And for the Stimulation of Off-Peak Load

tirely around the circumference and one large nozzle handling about 25 per cent of the water in the center and extending some 36 in. above the water level spraying up to a height of seven to eight ft. Drift is increased from a pond of this design, but the gross area required is far less than in the standard design. In an effective area of about 380 sq. ft. and a gross area of less than 450 sq. ft., including curbs, we are successfully dissipating about 8300 B.t.u. per minute, and at no time during the last season (from August on) did we have trouble due to water being too warm. The spray pond operates on a 10-degree differential, depending on the wet-bulb temperature, but ranging from 77° F. to 82° leaving the pond, with maximum wet-bulb temperatures usually from 70° to 75°. Temperatures of water returning to the pond from the machine are therefore ordinarily from 87° to 92°. An additional factor in the selection of the spray pond was that the spray pond is ornamental, and a tower would have detracted from the building's appearance.

In the setting up of the machine proper, the major difficulties encountered were with the soft solder connections on the evaporator coils, which were purchased as a part of the machine, and with the large number of flange connections which had to be made tight. The soft solder problem was so severe that on the second machine (to be installed in our Santa Ana office), we specified that all silver solder should be used. Also, on this second machine the evaporator coils were purchased locally. These coils were made to special design and are of a type more in favor for West Coast conditions, being of only four row depth and large face area while the standard Williams coils are of 12 row depth.

In the steam piping to the heater coil, standard steam fitting practice was followed, except that no return traps or pumps are used to return water to the boiler. The operating steam pressure is kept at about 12 lbs. per sq. in. gage; the entire piping system is closed and without obstruction; the pressures in the flow and return lines are thus equalized and the water returns to the boiler in good shape. Venting is by means of vacuum check, close against steam and water vents on the heater coil of the machine.

In the installation of a machine of this type it must be borne in mind that the available pressure causing refrigerant to flow from the receiver to the evaporator is relatively low, and consequently the machine itself and the evaporator coils must be placed on very nearly the same level. Also, the available head causing the flow of refrigerant vapor from the evaporator coils to the absorber is the difference in vapor pressures between the pressure of the refrigerant at the evaporator temperature and the vapor pressure of the solution in the absorber at the available cooling water temperature. These two restrictions necessitate the use of liquid and vapor refrigerant flow lines designed to give substantially lower pressure drops than could be tolerated in a conventional system. In the Pomona installation an error was made by installing too small a line between the evaporator and absorber, and we have since found it necessary to replace this line with a larger one.

With the background of experience as outlined above, the selection of the machine for the Santa Ana office was an evaporative condenser model also supplied as standard equipment by the Williams Corp. The building at Santa Ana is essentially a one-story building divided into three main parts; a front office consisting of public space, service counter and offices with full or partial partitions, a bookkeeping room segregated from the main front office, and garage space in the rear. As the office was to be remodeled at the same time as the air-conditioning apparatus was to be installed, it was decided to appropriate a small portion of the front office for fan room and conditioning chamber and to place the boiler, heater, liquor pump, and the evaporative cooler unit housing the absorber and the condenser directly in back of the fan room and separated from it by an already existing building wall. The fan room and conditioning chamber which also acts as a return plenum can be seen in

FIG. 2. This cooling pond is a part of the recirculating system installed to conserve the water used in the refrigeration machine in the company's Pomona office.

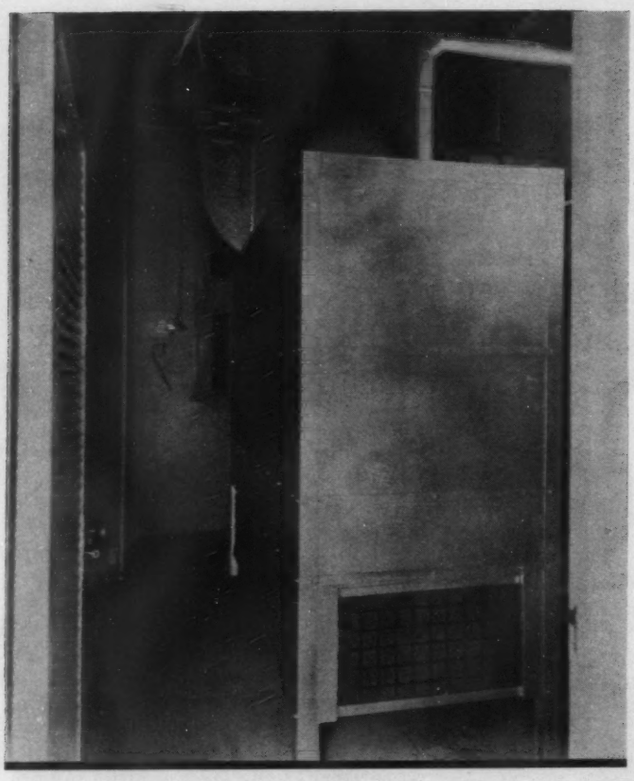


FIG. 3

Fan room and conditioning chamber installed at the Santa Ana office of the Southern Counties Gas Company.

Fig. 3, the balance of the equipment in Fig. 4. This unit is equipped with thermostatic control for summer and winter air conditioning, the control system used being Minneapolis-Honeywell. No humidification is used in winter, and coil temperature controls humidity in summer. The summer control is compensated for outside air temperature so as never to allow a differential greater than 15° between inside control temperature and outside air temperature. Winter heating is done by means of an extended surface copper tube heating coil and modulation of heating effect is accomplished by means of a modulating thermostat operating a motor driven modulating steam valve in the flow line to the heater coil.

When this system was laid out, the controls were designed to be actuated by a three switch, low voltage panel located in the main office space. The system was completed too late to acquire any operating data on its operation on the cooling phase, but we have found that due to the high heat gain from the lighting fixtures, during the last winter many days occurred in which heating was required only for a short time in the morning; then the temperature would build up to a degree which was in excess of that desired for best working conditions. This condition would go unnoticed and the machine would not be turned to the cooling phase. As a remedy for this condition we are considering either the installation of automatic outside air dampers to compensate for this condition of putting the entire control of the machine on one switch and allowing it to select the proper phase of operation, heating, cooling or circulation and ventilation, by thermostatic action.

The Santa Ana installation has given very satisfactory service so far, both on heatng and for the few hours that the cooling plant has operated. We made, however, one discovery worthy of mention here. As was previously stated, the refrigeration machine works on a steam pressure of about 12 lbs. per sq. in. On the Santa Ana job we wished to operate the heating on the same pressure and continue to get the desirable modulating effect. This problem was discussed with the control people, and it was their opinion that the modulating steam valve, with constant air flow, would give us the desired result and properly return the water to the boiler. Such was not the case. It has been found that the pressure reduction through the steam valve, together with the high condensation rate in the coil, caused such a reduction in pressure at the coil as to unbalance the system and prevent the condensate from returning to the boiler. Steps are now being taken to remedy this situation, either by the installation of a Dunham system on the heating cycle, the installation of a condensate return pump, or by modulating the air flow by means of a by-pass.

From the gas man's point of view, these two installations have presented certain new problems of equipment application, installation and control. Our experience on these two jobs has led us to believe that as soon as equipment of this type is available for distribution it can serve to open up a new field for summer gas load, that of comfort cooling.

Cost Analysis

It is possible that many of our readers are wondering what the first and operating costs are on such equipment. As to operating costs, we can only say at this time that we expect the operating cost to be about the same, perhaps as much as 10 per cent lower than the operating costs on conventional electric driven equipment. Detailed figures will be available at

(Continued on Page 87)

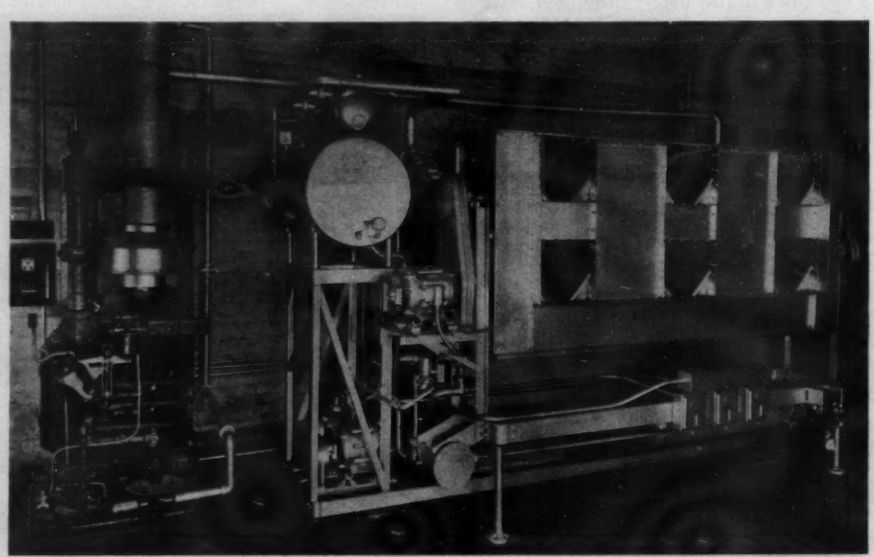


FIG. 4. The air conditioning equipment shown above, which includes an evaporative model of air-conditioning machine, was installed at the Company's Santa Ana office.

An Estimation of the Natural Gas Supply in the United States

By RALPH E. DAVIS

Ralph E. Davis, Inc., Pittsburgh, Pennsylvania*

THE natural gas industry has expanded its facilities and business during the past 15 years possibly in greater ratio than any other major industry. The total gas delivery in 1936 approximated 2.2 trillion cu. ft. This compares with a total approximate gas delivery of one trillion cu. ft. in 1923. This expansion has been accomplished by the construction during the past 15 years of approximately 25,000 miles of major pipe lines, thus doubling the pipe line facilities available 15 years ago. This growth involving the expenditure of enormous capital has of necessity been predicated upon natural gas supplies of great and trustworthy extent. Just as each individual operating company should from time to time examine its gas reserve position, it is the purpose of this article to look into the gas reserve picture of the industry as a whole.

Some three years ago I had occasion to estimate the known gas reserves of this country and at that time placed the figure at 62 trillion cu. ft. A similar survey just completed has given a figure of 66 trillion cu. ft. Thus it is seen that new discoveries of natural gas have been in excess of current deliveries and that taken as a whole the gas reserve position of the industry is quite secure.

Prior to 1920 the natural gas industry had developed to major proportions in the Appalachian gas field area. A substantial development had also taken place in eastern Kansas, in Oklahoma and in north-central Texas and in southern California. At that time enormous gas reserves had been discovered in certain regions believed at the time to be too far removed from large centers of population to make practical the construction of major pipe line systems from these fields to adequate markets. Men having command of large amounts of capital came to have faith in the adequacy of these gas fields, and there developed simultaneously a substantial improvement in the art of constructing natural gas pipe line systems. The result has been the taking of natural gas from Monroe, La. to St. Louis, to Atlanta and Birmingham, Memphis and New Orleans, to Dallas and Fort Worth; the development of a natural gas system in south Texas which connects many of the fields of that region with Houston, San Antonio and many other cities; the large development of pipe line systems from the Amarillo field resulting in natural gas being delivered to Chicago, Detroit, Minneapolis and Denver; the expansion of the industry in California which resulted in natural gas service in the San Francisco Bay district and a natural gas development in Montana resulting in the delivery of this fuel to Butte, Anaconda, Helena and Great Falls. These are the major developments of the past fifteen years. There have been many lesser developments.

Inasmuch as an enormous gas reserve located in an isolated locality such as, for example, southeastern New Mexico is now, and may forever remain of no practical importance to natural gas consumers in a distant part of the country, it is essential that the reserve of each province be adequate for the system that it supports. We will, therefore, review briefly the gas reserve situation in the several major natural gas provinces of the country.

In the Appalachian region natural gas is found over a wide area in the States of New York, Pennsylvania, Ohio, West Virginia and Kentucky in a great number of pools of small extent, no one of which constitutes as much as five per cent of the total reserve. The pay portions of the producing formations are not thick compared with those of the California fields but they usually are close grained which makes for relatively long-lived production. The producing horizons in the Appalachion region are found in the great trough of the Appalachian Geosyncline, the axis of which passes through western Pennsylvania and West Virginia. The producing horizons in Ohio are found principally in the Silurian formations with some production occurring in the underlying Ordovician. The Ordovician lies at great depth in Pennsylvania and West Virginia and where tested has been found productive only along anticlinal crests. Hence it appears improbable that their development will result in long-lived production. In Pennsylvania, West Virginia and Kentucky, the principal production is found in formations of Pennsylvanian, Mississippian and Devonian Age. Recently, production in the Oriskany Sandstone of Lower Devonian Age has added to the supply in northern Pennsylvania, southern New York and southern West Virginia. The large capacity of the Oriskany wells together with their high rock pressure has created a temporary condition of oversupply in the areas where found which sometimes tends to create in the public mind belief that the gas supply generally is inexhaustible. The total supply added by recent Oriskany development approximates 500 billion cu. ft. and this taken with the other discoveries in recent years which have been of a minor nature, has not been sufficient to balance the withdrawals with the result that gas reserves of the Appalachian district continue to show the gradual decrease exhibited

ACKNOWLEDGMENT is made for the cordial assistance of Roy M. Bauer, gas supply supervisor of the Southern California Gas Co., in the study of the gas situation in California; of John S. Ivy, chief geologist of United Gas System for similar cooperation in the study of the Gulf Coast Fields; and of E. E. Roth, chief geologist of the Columbia System for cooperation in the study of the Appalachian fields.—Author.

*Excerpts from a paper, "The National Gas Supply of the United States," presented before the Mid-West Gas Association, St. Paul, Minn., April 12, 1938.

during the six or eight years just past.

Gas reserves in this territory are most frequently estimated by the rock pressure—decline in production method. We have recently estimated the natural gas reserve of the Appalachian region at six trillion cu. ft. The annual rate of withdrawal in recent years has varied from 250 to 350 billion cu. ft. Using an average annual rate of 300 billion cu. ft., this reserve is equivalent to a 20-year supply.

North Central States

In the north-central States of Michigan, Illinois and Indiana, natural gas has been known to exist for many years, but no important source of supply has been found since the development of the Trenton Field in northwestern Ohio - northeastern Indiana some 30 years ago. In Michigan our knowledge of the conditions which influence the occurrence of natural gas and oil is largely confined to information revealed by the drill since a thick blanket of glacial drift obscures practically the entire basin which comprises the Lower Peninsula. Reserves developed up to the present time comprise less than 100 billion cu. ft. and are not sufficient to assure an adequate supply for any of the markets in that State for more than a limited period. The occurrence of gas is governed by structural conditions, the State being traversed from the northwest toward the southeast by a series of parallel anticlinal folds. The gas is found chiefly in the Mississippian formations, no important reserve having yet been developed in the underlying Devonian from which is obtained the principal oil production of the State. A number of tests have been drilled to the Ordovician in scattered localities, but sufficient testing has not been carried on to this horizon to warrant the belief that it may become an important source of gas in this State.

Recently, intensive investigation and development in the Illinois Basin which has extended into western Indiana have shown the possibilities of development of important oil pools in this district. Up to the present time no gas pools have been discovered by this most recent development, but it is not unlikely that the widespread activity will result in the discovery of small gas pools. The most recent development in Illinois has been in formations above the Devonian, but the Devonian is known to produce in this region and the underlying Silurian and Ordovician are well within the reach of the drill and will eventually be tested in all probability.

In this vast area which extends for a distance from 800 to 1,000 miles north and south and possibly an even greater distance east and west are found many varying conditions including those of topography, climate and geology. The region is so large that it supports not less than five major natural gas marketing enterprises. In addition, it serves as the basic source of supply for the exportation of gas to large centers of population in the north and east.

From the standpoint of geology, the region presents as great a variation as that above described in range of age of the formations in which the gas and oil are found as well as complexity of conditions under which reserves occur. There are a number of separate geologic provinces contained in this area with the range of producing formations extending from the Tertiary through to the Ordovician.

There are many important sources of gas in this region the more important of which are Amarillo, Hugoton, Monroe, Lee County and Rodessa; of these the combined reserves of the Amarillo and Hugoton Fields comprise nearly half the known gas reserves of the entire United States. In recent years important additions to the gas supply of the Mid-Continent territory include discoveries at Agua Dulce in Texas; Rodessa, Cotton Valley and Sligo in Louisiana. These recent discoveries in Louisiana open up a large additional territory for prospective development of gas and oil reserves. The total known gas reserves of this region which includes Texas, Louisiana, Mississippi, New Mexico, Oklahoma, Kansas and Arkansas are estimated at 51 trillion cu. ft. This truly is an oil and gas empire.

CALENDAR

May, 1938

Pennsylvania Gas Association—Sky Top Lodge, Sky Top, Pa., May 3-5.

A.G. A. Natural Gas Department—Roosevelt Hotel, New Orleans, La., May 9-12.

International Petroleum Exposition—Tulsa, Oklahoma, May 14-21.

American Society of Mechanical Engineers, National Oil and Gas Power Meeting—Dallas, Texas, May 15-18.

Indiana Gas Association 1938 Convention—Hotel Gary, Gary, Ind., May 16-17.

A. G. A. Commercial and Hotel and Restaurant Sales Conference — Commodore Hotel, New York, N. Y., May 23-24.

American Petroleum Institute, Midyear Meeting—Wichita, Kan., May 23-25.

A. G. A. Production and Chemical Conference—Hotel Pennsylvania, New York, N. Y., May 24-26.

Association of Gas Appliance and Equipment Manufacturers — The Greenbrier, White Sulphur Springs, W. Va., May 25-27.

Annual Petroleum and Natural Gas Conference—State College, Pa., May 27-28.

The Institution of Gas Engineers—75th Annual General Meeting, London, England, May 31-June 3.

June, 1938

A. G. A. Home Service Conference and Training Course—Hotel Muehlebach, Kansas City, Mo., June 7-10.

Canadian Gas Association—31st Annual Convention, Royal York Hotel, Toronto, Ont., Canada, June 9-10.

Danish Gas Association—Allings-Sandvig, Denmark, June 15-17.

Pacific Coast Gas Association, Northwest Conference—Portland, Ore., June 16-17.

Society of Chemical Industry, Annual Meeting of all Sections—Ottawa, Canada, June 20-22.

New England Gas Association Sales Conference—Viking Hotel, Newport, R. I., June 23-24.

American Home Economics Association—William Penn Hotel, Pittsburgh, Pa., June 28- July 1.

July, 1938

Michigan Gas Association—Grand Hotel, Mackinac Island, Mich., July 5-7.

West Virginia Oil and Natural Gas Association—Charleston, W. Va., July 27-28.

September, 1938

Pacific Coast Gas Association—45th Annual Convention, Santa Barbara Biltmore Hotel, Santa Barbara, Calif. Week of September 12.

October, 1938

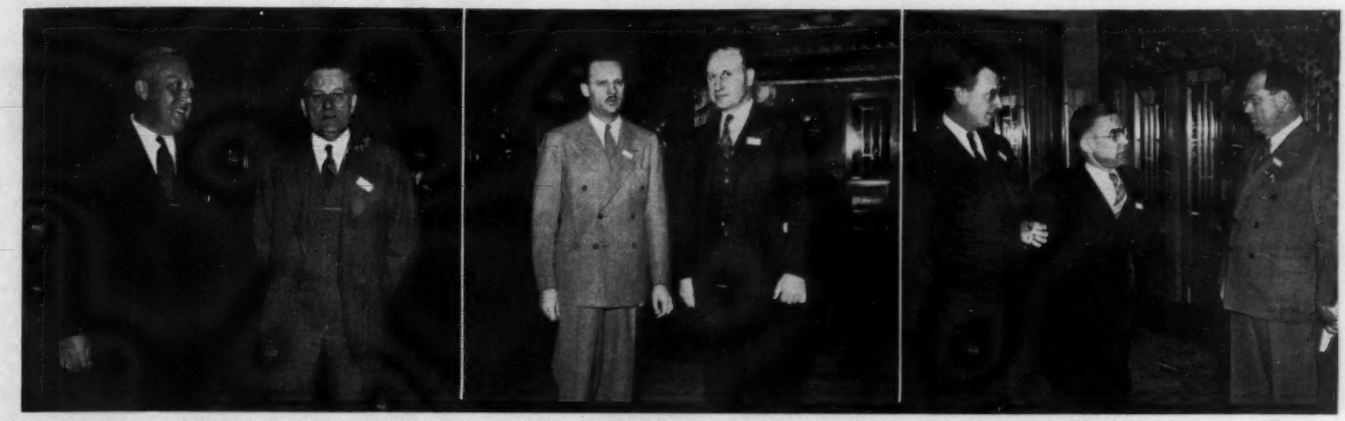
A. G. A. Twentieth Annual Convention—Atlantic City, N. J., week of October 10.

Rocky Mountain Region

In the Rocky Mountain region, the principal known sources of supply are found in Montana and Wyoming. Up to the present time Colorado has not been developed extensively. Production of oil and gas in this region is governed by structural conditions. The principal gas producing formations are of Cretaceous Age. Promising prospects also exist for finding additional gas reserves in the Tertiary in which structures have not been extensively tested, since only recently they have been found to produce oil. The principal known reserves are in the Cutbank and Baker-Glendive Fields in Montana and in the fields of the Big Horn Basin in Wyoming. The Bowdoin Field in Montana also contains an important reserve. The proven supply here comprises approximately three-quarters of a trillion cu. ft. in Montana, 600 billion cu. ft. in Wyoming and 100 billion cu. ft. in the Hiawatha Gas Field of northwest Colorado located a short distance south of the Wyoming line, or an aggregate known gas reserve of approximately 1.5 trillion cu. ft. Market conditions in this region have hindered the search for and development of natural gas and it is likely that its remote location from important centers of consumption will continue to retard development.

Gas production in the State of California is principally casinghead gas which is produced together with the oil. In 1937 only three per cent, ap-

(Continued on Page 86)



ABOVE: (reading from left to right) H. C. BLACKWELL, president, and A. C. MOORHAUS, vice-president and general manager, Cincinnati Gas and Electric Co.; L. B. DENNING, Jr., Community Natural Gas Co., Dallas, and E. L. HENDERSON, United Gas Corp., Houston; A.G.A. Distribution Committee chairman H. L. GAIDRY, New Orleans Public Service, Inc. and Distribution Committee vice-chairman CHAS. P. TURNER, The East Ohio Gas Co., Cleveland, confer with L. W. TUTTLE, Public Service Co. of Northern Illinois, Oak Park, Ill.

A. G. A. Distribution Conference

By CRAIG ESPY

ALMOST 400 distribution gas men, 378 to be exact, settled down for a three-day stay in Cincinnati, April 4, 5, 6, to attend the A.G.A. Annual Distribution Conference, to talk over their problems together, and to hear some of their number bring fresh viewpoints concerning the ever advancing distribution phase of gas service.

It was evident to all that the men were bent on arriving at solutions to their questions by the way the gas men gave ear to the discussions, by the lively discourse between the delegates, and by the generous attendance —for it almost seemed as though each man had been given a seat number and the command to be in place each time the opening bell rang, so well attended were the meetings.

Harold Gaidry of New Orleans, general chairman of the Conference began to stage the events promptly at 10 a.m. Monday, leading into a program perfectly balanced from the standpoint of natural gas, manufactured gas and mixed gas. He first introduced H. C. Blackwell, president of Cincinnati Gas & Electric Co., the host organization, which later was to receive homage from all delegates in terms of a resolution of thanks for the splendid hospitality which the company had accorded. In addition to bringing the greetings of his company, Mr. Blackwell gave a brief resume of the gas situation in Cincinnati.

Major Alexander Forward, managing director of the American Gas Association, also brought a special greeting to the group, emphasizing trends of the industry, its important future, and the place of the gas distribution man in the scheme of events. "He is as important to the gas industry," said Major Forward, "as the economist is to the national distribution scene."

E. H. Poe, secretary of the Natural Gas Department, brought a brief greeting to the group and invited all to attend the meeting of the department in New Orleans, May 9-12. Harold Gaidry, aforementioned as hailing from New Orleans, soundly seconded the idea in good southern drawl.

F. M. Goodwin, vice chairman of the technical section of American Gas Association, in a paper entitled, "A.G.A. Sectional and Departmental activities of Interest to the Distribution Engineer," showed why the sectional groups should no longer be interested only in their own affairs, but in the interests of the whole; and how important it was for the distribution engineers to be conversant with the activities, for example, of the Production and Chemical Committee, Industrial Section, Commercial Section, Gas Appliance & Equipment Manufacturers, A.G.A. Laboratories, and the many committee projects.

He sketched the activities of some of these groups mentioning particularly the various phases of gas conditioning being studied, what the industrial departments were doing with volume water heating, steam generation, gas engine promotion, appliance servicing, dealer and plumber cooperation, standardization of controls, the A.G.A. Testing Laboratories program, corrosion committee activity, mixed gas research, etc.

Toward the close of his remarks Mr. Goodwin spoke of the dependence of the industry on its manufacturers of equipment, saying that he had recently checked the number of articles carried in the distribution store-house of Boston Consolidated and found that there were over 10,000 items.

Dr. W. A. Pearl, Armour Institute of Technology, Chicago, next talked on the two-fold subject, "The Metallography of Welding and The Importance of Training Welders." He backed up his technical discussion of metals and their behavior with a showing of slides, lending emphasis to the points covered.

H. G. Horstman, Public Service Co. of Indiana, presented a summary of practices of certain operating companies pertaining to welding and special training given welders in a paper entitled, "Practices of Certain Operating Companies."

At this point the session adjourned to various luncheon groups, resuming the following morning with the report of the Committee on Pipe Coatings and Corrosion, delivered by A. V. Smith, The United Gas Improvement Co., chairman.

Hugh Cuthrell, Brooklyn Union Gas Co., in discussing the New York World's Fair, described the layout of the Fair grounds and its gas services,

GAS CAMERA

—*Photo, Courtesy A. Gordon King, American Gas Association*

A GROUP FROM the Downtown Gas Engineers Lunch Club, New York, honors Erick Larsen, who leaves Long Island Lighting Co. to become assistant to Alfred Hurlburt, vice-president, Republic Natural Gas Co., Corpus Christi, Texas. Front row: F. W. Parsons, "Gas Age;" Mr. Larsen, W. P. Hutchinson, Sprague Meter Co. Center: G. H. Magee, Long Island Lighting Co.; T. B. Williams, Utility Management Corp.; A. E. Lockwood, Penn-Western Service Corp.; E. J. Murphy, Brooklyn Union Gas Co. Back Row: J. R. Wohrley, Cities Service Co.; Stanley Jenks, "G A S;" A. I. Phillips, "American Gas Journal;" A. Gordon King, American Gas Association.

IN COMMEMORATION of a century of public service, the Louisville Gas and Electric Co., Louisville, Ky., last February published a 32-page historical rotogravure section in the Louisville Courier-Journal. Below, Advertising Manager J. H. Green, left, and Vice-president Robert Montgomery, right, go over drawings for the section with R. Francis Richey, artist.

G. K. BREITENSTEIN (left), advertising executive, Richfield Oil Co., California, alights from a United Air Lines Mainliner, after one of his frequent air trips to Eastern and Pacific Coast points.

AT LEFT

E. C. Whitcomb, new business manager, and Floyd Carmichall, division manager, Lone Star Gas Co., Fort Worth, Texas, chat with Newshawks James McBride and A. L. Shuman of the Star Telegram at the Annual Gridiron Banquet of the Fort Worth Advertising Club. Back to the camera is Club President DeWitt Morgan; listening is Clyde Perry.

—*Photo, Courtesy Advertising Age*

OFFICIALS OF Servel, Inc., hold an informal reception in the N.B.C. studio in New York, following the first 1938 presentation of "The March of Time." In the foreground, left to right, are F. E. Sellman, vice-president, the "sound effects" man, B. O. Brown, regional sales manager; William Reynolds, advertising manager; and George S. Jones, vice-president and general sales manager.

—*Photo by Nat Blinks, General Gas Light Co.*

AT THE Registration desk for the Industrial Gas Sales Conference held in Pittsburgh, March 7 and 8, are (left to right) R. L. Manier, Syracuse Lighting Co.; Hale A. Clark, Detroit City Gas Co.; and H. C. Haroldson, Commonwealth and Southern Corp., Jackson, Mich.

and the participation in the Fair by the gas industry and individual companies. The promotional efforts and cooperation of all branches of the industry in building attendance and in general support of gas activities at the Fair were urged.

Dr. Scott Ewing, research associate, National Bureau of Standards, presented, "Recent Developments Relating to Soil Corrosion and Pipe Coatings" in which he summarized various developments reported at a recent closed-conference on soil corrosion held at the National Bureau of Standards. His report dealt with soil corrosion, cathodic protection and electrolysis, treatment of metal prior to coating, coating material, tests and specifications, and pipe practices.

Installation and service experiences with commercial refrigeration were dealt with by T. J. Perry, Brooklyn Union Gas Co. His talk traced the progress of commercial refrigeration and described installations that had been put in by Brooklyn Union Gas Co. as to types of companies served, the mechanical set-up of the installations and also presented actual service records of some of the jobs.

Another paper treating servicing problems and received as one of the leading presentations of the conference was that of E. W. Cristell of The Peoples Gas Light & Coke Co., whose subject was "The Servicing of Domestic Appliances." This paper placed special emphasis upon training men continuously in the operation and adjustment of the modern, full automatic gas appliance, stating that the manufacturer, the utility or the dealer were definitely to blame if the servicing organization was unable to fulfill requirements for servicing modern, present day appliances.

The paper covered fundamental training, the proper servicing of the modern gas range, training procedure, burner adjustment, prompt installation, servicing difficulties, gas flow, simplified range design. In concluding, the paper pointed out how essential it was to guard against the possibility of servicing organizations growing stale and failing to make precise adjustments. Both correct and incorrect flame adjustments of burners were pictured by means of slides.

That afternoon the strictly natural gas men had their special innings with the first speaker being Secretary E. H. Poe. "The Odorization of Natural Gas in the Southwest," described by E. L. Henderson, United Gas Corp., began with mention of the enactment in 1937 of the Texas law requiring gas served for domestic purposes in cities and towns to be treated with a warning agent. He spoke of the results in dealing with leaks in 308 towns following the first 60 days of operation after beginning odorization. His paper also described the two types of odorization apparatus in use in the Southwest.

Descriptions were given and slides shown of drip-type, positive injection type, proportional absorption type odorizers with wicking and with baffles and with liquid level control. Gas flow temperature charts and charts showing effect of pressure on rate of absorption were also shown.

Mention was also made of the method developed by T. S. Whitis of West Texas Gas Co. for obtaining an accurate adjustment for proper proportion of by-passed gas. (*GAS*, January, 1938, p. 12).

An interesting paper presented by L. B. Denning Jr., Community Natural Gas Co., on "Use of Cast Iron Pipe for Underground Work," described the laying of cast iron pipe across the Intercoastal ship channel by Texas Cities Gas Co., Galveston, Texas. The pipe replaced wrapped and coated steel pipe. Eight-in. Molox Ball Joints, of American Cast Iron Pipe Co., were a feature of the installation. The line was laid for operating pressures of from 90-175 lbs.

R. S. Wenner, The Ohio Fuel Gas Co., who spoke before the National Conference on Industrial Gas Sales in Chicago last June on "Building Load With Gas Engines for Power Generation" (*GAS*, July, 1937, p. 14), addressed the distribution men bringing additions to his original paper, which presented a fresh viewpoint on load building with gas engines.

Two committee reports, that of the Committee on Pipe Joints and Pipe Materials, brought by Chairman L. W. Tuttle, Public Service Co. of Northern Illinois and that of the Committee on Gas Main and Structural Strength offered by Chairman Eric Larson, closed the natural gas meeting.

JOHN C .CLARK, E. F. Griffith Co., Philadelphia Pa., and W. P. HUTCHINSON, Sprague Meter Co., Bridgeport, Conn.

F. A. HOUGH, Southern Counties Gas Co., Los Angeles and A. D. MacLEAN, Pittsburgh Equitable Meter Co., Pittsburgh.

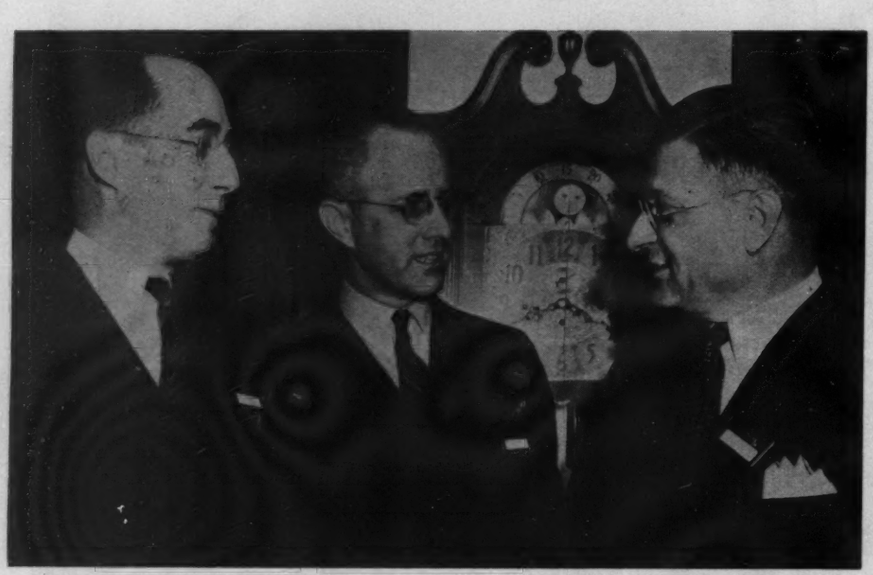
The concluding day of the three-day conference opened with the report of the Committee on Cast Iron Pipe Standards, given by C. C. Simpson, Consolidated Edison Co. of New York, Inc., as chairman.

In George E. Ludwig's talk, "The Chemist's Place in the Distribution Department," it was suggested that the chemical engineer might well serve as a liaison agent between the production and distribution departments where his knowledge of chemical engineering could be brought to bear on distribution and utilization problems. The chemical engineer, with proper background, was cited as fitted to deal with problems of gas conditioning, elimination of liquid and vapor phase gums, certain phases of gas leakage, odorization, rehydration and dust removal, gas utilization, performance tests on appliances and kindred subjects. The paper also quoted C. F. Turner's speech made before the 1937 Joint Production and Chemical Committee Conference concerning the place of the chemical engineer in house heating.

D. P. Allen, Washington Gas Light Co., followed with a paper on "The Economics of Metering," describing the application of the principles of accounting to meter costs and performance records of his company for 1936. M. E. Shea, Roanoke Gas Light Co., then related the experiences of his company in introducing tetralin into its distribution system by portable equipment.

Always at these conferences, one of the most interesting and profitable

(Continued on Page 50)



Conferring between sessions at the Annual Mid-west Gas Association Convention, held in St. Paul, April 11-13, are (left to right) association officers, S. D. Whiteman, newly elected president, Sioux Falls, S. D.; R. B. Searing, secretary-treasurer, Sioux City, Ia.; and E. J. Boyer, retiring president, Minneapolis, Minn.

Mid-West Gas Men Hold 33rd Annual Meeting

By CRAIG ESPY

PROGRAM planners for the 33rd Annual Convention of the Mid-West Gas Association, which met in St. Paul, April 11, 12 and 13, placed special emphasis upon sales, with the result that more than a dozen of the convention papers dealt with this theme, which is now so strongly before the industry nationally. The committee also went farther away from home than was its custom to obtain some of its keynote speakers, with two of them coming from Texas, one from New York, one from New Jersey, one from Pennsylvania, and another from Missouri.

E. J. (Pat) Boyer, president of the Association, presided over the conference the first day until his position was relinquished to S. D. Whiteman of Sioux Falls Glass Co., Sioux Falls, South Dakota, who became president in the election held at the close of the first morning of the convention.

Taking office with Mr. Whiteman were F. J. Gunther, Iowa-Nebraska Light & Power Company, Lincoln, Neb., first vice-president; C. B. Dushane, American Meter Co., Chicago, second vice-president; R. B. Searing, Sioux City, Iowa, secretary-treasurer, who has served for many years in this position. Council members elected for 1938-1941 are W. L. Hayes, Minneapolis; E. E. Hahn, Cedar Rapids; R. J. Hageman, Cedar Rapids, and C. J. Starke, Huron, S. D. Affiliation representatives elected were H. M. Taylor, Cedar Rapids, Manufacturer's Section; A. C. Rathkey, Waterloo, Ia., Technical Section; C. F. Willeford, Council Bluffs, Ia., Industrial Section; Robert T. Davis, Iowa City, Accounting Section, and A. S. Olson, Fort Dodge, Ia., Commercial Section.

In opening sessions Mr. Boyer presented Hon. Mark H. Gehan, mayor of St. Paul, who welcomed the delegates, recommended, as a matter of advice, that the gas men take more of a hand in the national political scene in order that their interests might better be served. G. O. House, manager St. Paul division, Northern States Power Co., one of the host companies, responded to the welcoming address of the Mayor.

In the president's message Mr. Boyer showed the progress and the status of the gas industry and particularly that portion of it served by the Mid-West Gas Association since its formation in 1905. The area embraced includes the states of Iowa, Nebraska, North Dakota, South Dakota and Minnesota.

The gas load was 16 times greater in that area in 1936 than it was in 1905, it was pointed out. This amounted to a 1500 per cent increase. Gas range installations had grown from 111,000 on duty in 1905 to between six and seven hundred thousand. While the population more than doubled, the gas industry made a 300 per cent gain. Gas mains increased from 1692 miles to 9843 miles in 1936, a gain of 480 per cent.

He also gave facts about the competitive cooking situation, quoting President Herman Russell of Rochester Gas & Electric and the Queensborough Gas & Electric Co. of New York, both combination companies, who expressed a decided preference for the gas range over the electric range from the standpoint of cost of the appliance, cost of operation, reliability, heat value, and cooking satisfaction for the customer's dollar.

R. S. Agee, newly appointed promotion sales manager of A.G.A.E.M., made a dramatic presentation of the New Certified Performance Range, leading into his subject by showing how gas sold for cooking had decreased in volume and how with the encroachment of the electric range, the industry needs just such an appliance as the Certified Performance Range to stimulate and step-up its sales effort.

Demonstrating how the housewife lights her oven burner by the squat, stoop or kneel method, he emphasized the modern features on the new ranges and urged that the old be replaced with the modern, automatic types.

F. L. Banner, Minneapolis-Honeywell Regulator Co., as Manufacturer's representative of the A.G.A. reported on the activities of A.G.A.E.M., highly complimenting the work of this organization. The report of the secretary-treasurer and that of the auditing committee followed. New members were elected prior to the election of officers which concluded the morning's activities.

S. D. Whiteman, presiding at the afternoon session introduced E. H. Vieregg, Central Power Co., of Grand Island, Neb., who brought the report of the Accounting Representative of A.G.A. Merrill N. Davis, vice-president, S. R. Dresser Mfg. Co., spoke on coordinating the manufacturer and the utility.

Ray T. Ratliff, advertising manager, Kansas City Gas Co. and member of the National Copy Committee of

(Continued on Page 88)

Developing Additional Load Through Gas Engine Power

● **E. J. HATZENBUEHLER, chief industrial engineer, Lone Star Gas Co., Dallas, Texas, in a paper, "Developing Additional Load Through Gas Engine Power," delivered before the 33rd Annual Convention of the Mid-West Gas Association, St. Paul, Minn., April 11-13, 1938.—(Abstract by G A S).**

THE gas engine has load possibilities which should be thoroughly considered by every gas company. This particular discussion is the result of experiences in the Lone Star Gas System which serves 300 towns and cities in southern Oklahoma and Texas.

The gas engine as now developed is an economical, dependable, and flexible power plant. It may be applied to any use where the load factor is sufficiently high to justify the initial investment. It is available in all sizes and speeds from 10 hp. to 2,000 hp. During the past several years there have been developed several types of convertible engines. One type of convertible engine utilizes both Diesel oil and natural gas fuel simultaneously, the quantity of fuel oil used being from 5 per cent to 10 per cent of the total B.t.u. input. Other types of convertible engines may be changed from oil fuel to gas fuel, or vice versa, by changing cylinders, pistons, or cylinder liners and installing the conventional ignition system.

E. J. HATZENBUEHLER

Fuel consumption guarantees made on the convertible type engines are the same as those made on the non-convertible engines. Based on a recent price quotation made to a prospective engine purchaser in our territory, a gas engine plus the necessary parts to convert it to Diesel operation can be purchased for approximately the same price as a Diesel engine of the same size. This means that with very little increase in initial investment, an engine may be purchased which can operate on the cheaper fuel currently available. If gas is used as fuel and the gas rate at a later date is increased to a point where operation on oil fuel is cheaper, it will require very little time and expense to make the change. If, at a still later date, oil fuel increases in price and gas fuel offers cheaper operation, the change to utilize gas fuel can be made at no additional cost other than labor. Some prospects hesitate to buy a gas engine because it is dependent upon one company for its supply of fuel. They feel that a better fuel price can be secured when several fuel marketing agencies are bidding for the business as is the case where fuel oil is purchased. The fact that an internal combustion engine can be installed which can utilize the cheaper fuel available is of material assistance in accomplishing the breaking down of sales resistance.

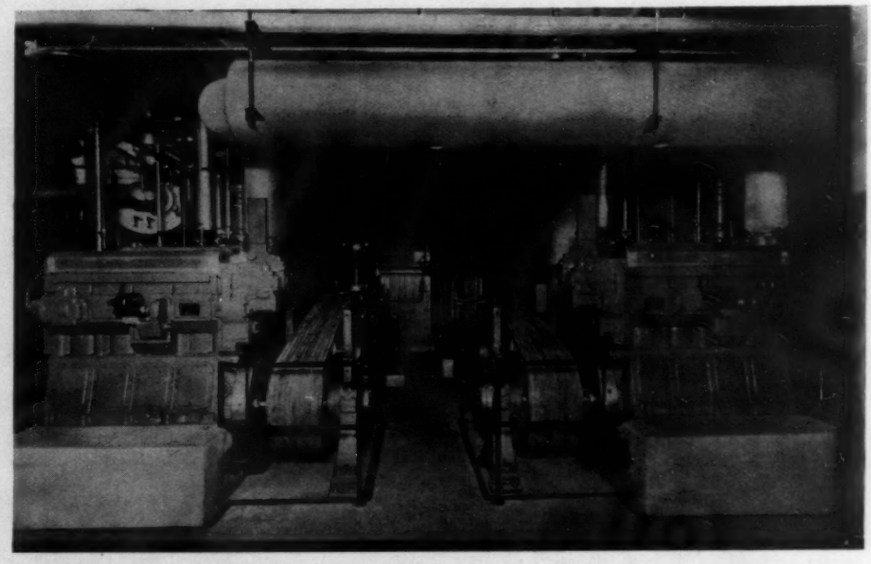
The gas engine is a reliable and long lived piece of equipment. There are numerous examples of gas engines that have been operating satisfactorily and economically for 20 or more years. One specific instance is the case of an 80 hp. gas engine installed in a cotton gin in 1913. For many years it has been and still is operating satisfactorily even though it is carrying an appreciable overload. According to the manufacturer's record the cost of repair parts has amounted to less than $200.00 for a 25-year period, or approximately 10c per hp. per year. There are other instances where gas engines have been operating satisfactorily for 15 to 20 years. In tracing the engines back we found where they had operated from three to seven years before they were installed in their present location. Some of them were operated originally on artificial gas in the Chicago district while others operated originally on natural gas in the Ohio area.

Gas engine manufacturers are now offering complete, ready to run power plants in the light industrial type engine. These package units are equipped with automatic clutch and automatic controls equal to those available for electric motors. These units require little attendance and are enclosed in sound absorbing cabinets, operating more quietly than the driven equipment. They are economical to operate and from present indications will operate for long periods without any appreciable maintenance expense.

Another interesting development in the application of gas engine power is the method of connecting a gas engine and a mechanical load to an induction motor as conceived by R. S. Wenner and D. M. Palmer, (*G A S*, July, 1937, p. 14).

The three conventional methods of applying gas engine power are: engine direct or belt connected to driven equipment, engine direct or belt connected to generator, and a combination of the above methods where the engine is direct or belt connected to driven equipment which constitutes the major part of the load and is also belt connected to a generator supplying auxiliary power.

It has been found that the greater number and best prospects are those whose equipment can be belt driven.



This view shows the magneto side of two EN-4 gas engines driving compressors for air conditioning in Sears, Roebuck Company's store in Dallas. The engines are four-cylinder with 8 1/2-in. bore and 10 1/2-in. stroke. Each is rated 120 horsepower at 514 r.p.m.

This method keeps both investment costs and operating costs at a minimum. Investment costs as compared to engine generator sets are reduced by a sum equal to the cost of the generator, switchboard and voltage regulator, which is normally one-half the cost of the entire power plant. Fixed costs are reduced because of the smaller investment. Operating costs are reduced by the amount of electrical losses occurring through generator, switchboard, and motors operating driven equipment. Less skilled labor is required to operate an engine direct connected or belt connected to driven equipment.

Multiplicity of Speeds

There is one inherent feature in the gas engine used on air-conditioning jobs that should not be overlooked. That is the multiplicity of speeds at which it can operate, the fact that its speed can be regulated from idling speed to maximum speed in such a manner that it supplies exactly the horsepower required almost instantly to meet the cooling demand. In one installation the engine was direct connected to a 40-ton compressor and its speed was controlled through suitable devices by the suction pressure of the Freon compressor. A thermal bulb installed in the cooling coils actuates an automatic expansion valve in the Freon line from the condenser to maintain constant cooling coil temperature. A pressure controller installed in the Freon compressor suction line actuates a Modutrol motor mounted on the gas engine, and the motor in turn actuates the gas throttle to increase or decrease the engine speed. This particular engine operates at speeds varying from 175 to 525 r.p.m. Under these operating conditions, the engine is expected to set a record for number of years service without major repairs.

It has been found that the gas engine offers a means of improving load factor. It assists in filling in the valleys in the load curve at profitable rates. Efforts have been concentrated on prospects who would use the greater portion of their annual fuel requirements during the off-peak season, such as ice plants, cotton oil mills, and air conditioning and the generation of power in theatres and large department stores and buildings. An analysis of gas engine sales shows that the engine load increases as the heating load decreases, and decreases when the heating load begins in the fall of the year. The peak is reached during the month of September which is normally one month before cold weather arrives.

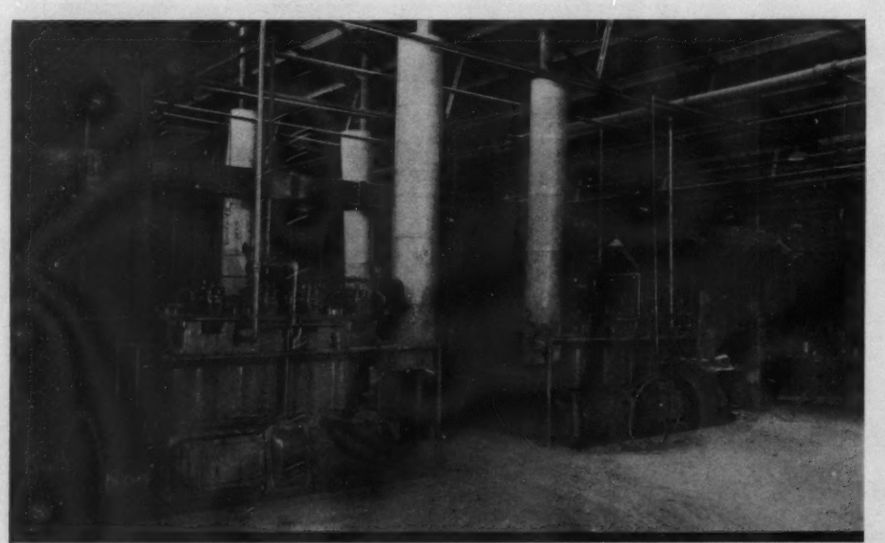
Gas for this engine load usually is sold at rates substantially higher than those obtained from other classes of industrial customers, and due to the low utilization pressure required and the relatively low maximum hourly demand of gas engines, gas in most cases can be supplied from the existing low pressure distribution system at very little cost.

Data contained in the Industrial Gas Section's "Gas Engine Power Committee Report for 1937" shows the revenue derived from this type of load to lie between $1.47 and $10.53 per hp. per year. The average of the companies reporting was $4.59. The revenue per account served varied from $176.00 to $1,132.00 per year. The average revenue per account was $504.76 per year. The average sales price per M c.f. was approximately 26c or 26c per million B.t.u.

To artificial or mixed gas companies this average sales price may appear low, but to natural gas companies operating in the Southwest, this is considered a satisfactory rate when all facts are taken into consideration. It is approximately 35 per cent of the average price received from domestic customers and very nearly twice the average price per M c.f. received from all industrial accounts. Competition for the power load is very keen. Both Diesel engine companies and electric utility companies maintain very wide awake and efficient sales forces. In very few instances does Diesel oil sell in excess of 3¼ cents per gal. delivered in buyer's storage tanks. During the last several years it has sold for a price as low as 2 cents per gal. delivered. Electric power rates average from 1c to 2½c per kw. hr., with large users paying less than 1c per kw. hr.

Yearly Increases

In spite of low Diesel oil prices and electric power rates, the Lone Star Gas System has been able to increase its gas engine load from 20,000 hp. in 1931 to 54,000 hp. at the present time, or an average increase of 5,600 hp. per year. Of this 54,000 hp., approximately 46,000 hp. is of the conventional heavy duty slow speed type of engine. The remaining 8,000 hp. is made up of the light industrial high speed or automotive type of engines. The different types of industrial or manufacturing plants powered by gas engines number in excess of fifty. Ice plants are the largest users of gas engines, with cotton gins, feed grinding and flour mills, cotton oil mills, machine shops, creameries, produce and cold storage plants, and theatres ranking in the order given. This total does not include the large number of gas engines operating in the oil field used for drilling, pumping and repressuring. Neither does it include engines operating in gas company pipe line compressor stations.



These four-cylinder, 110 horsepower gas engines are used to drive wire drawing blocks in the plant of the Texas Wire and Nail Company, Galveston, Texas. Four more gas engines, totalling 540 horsepower are also operating in this plant.

■ ■

Production and Chemical Committees Meet May 23-25

A joint Committee Conference of the A.G.A. Production and Chemical Committees will be held May 23-25 at the Hotel Pennsylvania, New York, N. Y. Session chairmen will be C. R. Locke, chairman, Gas Production Committee, and Professor J. J. Morgan, chairman, Chemical Committee.

● **STERLING LINES, consulting engineer, Los Angeles, Calif.; in a paper, "Machine Application of Plastic Pipe Coatings," presented before the Bureau of Standards Fourth Soil Corrosion Conference, Washington, D. C., November 15-17, 1937.—(Abstract by G A S).**

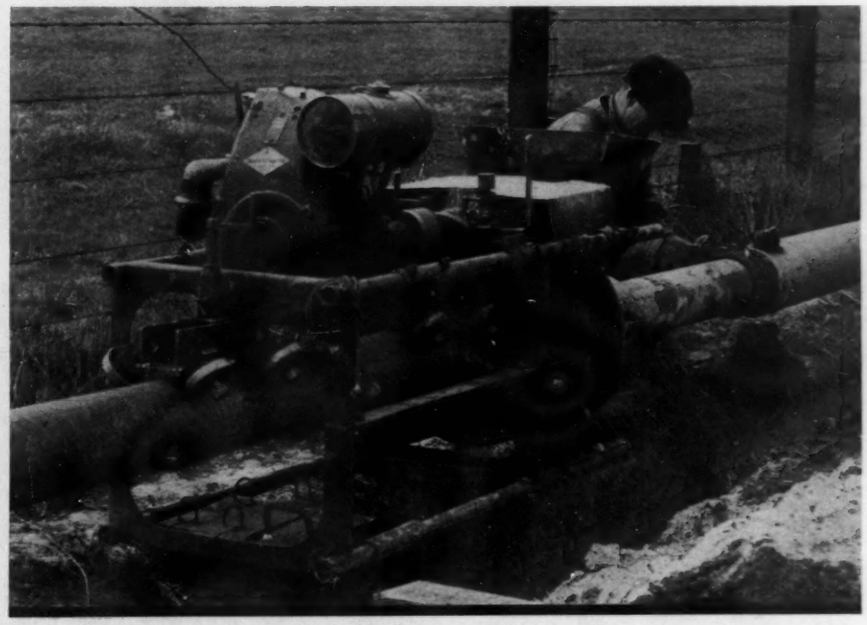


FIG. 1. Pipe coating machine for applying protective plastic materials

The Machine Application Of Plastic Pipe Coatings

THIS pipe coating machine shown in Fig. 1 has been under development over a period of several years and is based on the idea that properly prepared plastic materials could be made to adhere tightly to the outer surface of pipe while in the trench and in service, if applied under a condition of rubbing pressure, without support or forms of any kind.

This conception proved correct, and improvements on original design have greatly simplified the operation and extended the area and intensity of the rubbing and troweling pressure which is the secret of the process.

The machine is a simple mechanism, consisting of a light steel rectangular frame which encompasses the pipe and which is supported upon the pipe by adjustable and equalizing dollies. Upon this frame is mounted a three-hp. gas engine, which by means of a short shaft through universal joint and clutch and chain drives a steel drum surrounding and concentric with the pipe.

These machine parts are so designed as to be easily removed from the pipe, thus facilitating passage of obstructions, cross connections and the like. Upon one end of the drum is bolted one end each of a number of steel spiral lugs with free ends extending outwardly a few inches. These lugs are enclosed within a sheet-steel housing having a feeding hopper opening upon its upper surface. Hence the lugs in operation revolve about, but do not touch the pipe within an annular space formed by the pipe and the housing. As plastic material is fed through the hopper upon the pipe surface and the lugs, it is immediately forced toward the free ends of the lugs under pressure which increases to the point of compelling the machine to yield to or back away from the thrust, thus imparting motion to the machine along the pipe. Speed of travel is an automatic and direct function of the speed of supplying material to the machine. Fig. 2 illustrates the machine in use in the trench.

The completed coating or encasement accordingly emerges from the end of the housing, which is called the throat, and is firmly held into position by atmospheric pressure because of the intimate contact of steel with the plastic. Practicable limits of speed of travel are indicated as being from one to four lineal feet per minute, depending upon size of pipe and thickness of coating.

Overall width of machine need not greatly exceed the diameter of the pipe. As a matter of practical operation, varying sizes of extruding ends may be severally mounted upon a single frame, so that in the field, if desired, one frame and a number of extruding ends could cover a wide range of pipe sizes at a somewhat higher cost for wider trenching. Counterweights are attached to maintain upright position of machine on pipe, and spacing dollies allow for side adjustments. Variations in lug and housing design will permit a range of encasement thicknesses of from five-eighths of an in. to two in. or more. Weight of machine for ordinary pipe sizes without counterweights will not exceed 400 lbs.

Attention through some years of effort has centered largely upon the problem of applying cement concretes only, and field experience has been limited to their use. However, recently successful experimental work has been carried out with applications of other plastic materials such as high temperature mixtures of asphalt and sand oil emulsions with cement, sand and gravel, etc., thus demonstrating definitely that the method has much promise in application of a wide variety of plastic mixes. One prime requirement in all cases is that through the moment or two of maximum rubbing pressure the material must remain unaffected as to release of free water or moisture or sudden changes of temperature as with hot asphalt concretes.

Many trial runs have been made using admixtures with the cement, sand and gravel such as diatomaceous earth, bentonite clays, lime, emulsions such as Pozzolith, etc., all looking to improvements as to cost, densities, ease and certainty of application, etc. Generally speaking, the plain mix of standard cement, graded sand and pea gravel produced concrete of very good quality and entirely suitable as pipe encasement.

Experimentation using steel wire reinforcement has indicated that success may be achieved in use of wire as mesh, spiral or in short lengths added directly to the batch when loaded into the concrete mixer. In the use of steel wire mesh or spiral, it

is important that it be held in fixed position as the machine passes over, otherwise the green concrete may suffer such disturbance as not to contact the pipe surface properly. The final lodgment of the plastic against the steel surface must always be definite, positive and undisturbed.

Coating Strengthens Pipe

A promising field for use of reinforced cement concrete coatings as applied by this machine is for strengthening as well as protecting light weight steel pipe. Quite frequently when pipe becomes so fragile as to necessitate either abandonment or replacement, it will be entirely practicable to apply a heavy jacket without taking the pipe out of service or disturbing it in any way. Care would have to be taken in excavation to provide a few inches clearance and in the placing of properly spaced skids for pipe support. And it is important that such pipe be encased only when under actual operating service and pressure, thus to avoid stresses on the encasement which might develop because of deformity of section. And too, the pipe would then be under a condition of extreme expansion, a most important requirement.

An estimate of machine capacity per day of eight hours would be the placing of eight cu. yds. of material at the rate of one and one-quarter yards per hour. Hence speed of operation would become as follows, per machine:

For 6-in. pipe...200 ft. per hour
For 12-in. pipe... 80 ft. per hour
For 24-in. pipe... 40 ft. per hour

An adequate field crew per machine may comprise the following:

Handling pipe line	4 men
Machine operator and helper	2 men
Concrete shovelers	3 men
Mix operators	2 men
Motor truck operator	1 man
General utility	2 men
	14 men

This discussion of field crew per machine has reference only to application of cement concretes. Yet as few as three men could operate.

It is believed from field experience thus far that generous thicknesses of cement concrete coatings are always desirable. Thicknesses on a three-in. pipe should not be less than ¾-in., running up to over two in. for pipe above 18 in. These thicknesses give the jobs a structural or mass value and are an advantage in cases of autogenous healing should cracking or spalling occur. And too, they will allow for the inevitable irregularities which occasionally find their way into field work.

Taking the cost of plain cement concrete in the field mixed at $10.00 per cu. yd., the cost per sq. ft. one in. thick becomes three cents. Wire reinforcement will add a cent. With direct labor cost of a crew of 14 men figured at $70.00 per eight-hour day and 2,000 sq. ft. one in. thick, the amount applied per machine per day, direct costs are indicated to approximate the following, for low temperature plastics. Cost per sq. ft. one in. thick, concrete and direct labor only:

Concrete and steel	4.0c
Direct labor	3.5c
	7.5c
With plain concrete	6.5c

Hence on an eight-in. pipe these items of cost would become, per lineal foot, one in. thick:

With reinforced concrete.....21c
With plain concrete.....18c

Suitable cement concrete, if properly applied and of adequate thickness, may be taken to afford efficient pipe protection against all types of corrosion.

Concrete applied by the machine under consideration is of a high quality in uniformity and density; in other words there is no tendency to segregation of any portion of the mix, including those occasions in which short lengths of steel wire are added as reinforcement. This perhaps is the most outstanding characteristic of this machine and process.

FIG. 2. View of the machine applying a protective coating on pipe in the trench.

The water-cement ratio of cement concrete for best results in machine application will give a density well under five and one-half per cent absorption by weight. Under pressure as encountered in service generally no moisture will pass through from the contacting soil to the pipe surface.

Two Year Test

In the course of study incident to development of the machine and process three samples of four-ft. lengths of six-in. pipe were encased and buried at Los Angeles by the Southern California Gas Company, along with other samples of pipe protection, in high sulphate peat ground of pH 4.5 and corrosion index, nipple and can, 4.0. The cement concrete samples of one inch thickness were applied directly over the bare pipe, mill scale undisturbed.

On April 14 last, two-year specimens were removed and inspected by engineers of the company who are willing to answer any responsible inquiry as to results obtained with the concrete samples. Briefly, there was apparent no change of any kind in the concrete jacket, no evidence of stress, no cracking or separation from the pipe, no passage of moisture through the concrete section to the pipe. Active hydration was yet under way, as evidenced by the damp concrete as well as presence of moisture upon the pipe surface, with no evidence of rust. The most notable characteristic was the fine contact of concrete and steel.

With a water-cement ratio of five gals., the mix by volume was as follows:

cement	1.06 parts
concrete sand	1.65 parts
roofing (pea) gravel	1.75 parts
	4.46 parts

The three samples when buried were structurally sound and the density of the uniform concrete would show under test an absorption of not to exceed five per cent.

■ ■

Smaller Holding Companies Register Under New Ruling

Following the Supreme Court decision in the case of the Electric Bond and Share Co., the smaller public utility companies began registering in March with the Securities and Exchange Commission under the Holding Company Act. Among those registered are Central Public Utility Corp., Jersey City, and its subsidiary, Consolidated Electric and Gas Co., and the Philadelphia Electric Power Co., a subsidiary of United Gas Improvement Co.

● **H. G. HORSTMAN, Public Service Co. of Indiana, Indianapolis, Ind., in a paper, "Gas Company Welding Practices," presented before the American Gas Association 15th Annual Distribution Conference, Netherland Plaza Hotel, Cincinnati, Ohio, April 4, 5, 6—1938.—(Abstract by G A S).**

FIG. 1. A typical welding class.

Training Welders—A Review Of Gas Company Practices

THE practice of welding, by utility companies, has enjoyed rapid growth in recent years due to the many inherent benefits of this method of fusing or joining metals. The trend towards higher pressures has emphasized the fact that welds, properly made, will withstand the same conditions as the base metal. Of the many factors entering into the completion of satisfactory welds, the human element is still one of the most important. Welding design, layout work, and materials have all been improved during recent years and in order that these improvements could be successfully utilized, it has become necessary to train and recheck the technique of the operating welders.

A number of companies were recently contacted to determine the methods used to train and qualify their welders. The manner in which welders were recruited varied with the size of the companies reporting, and the type of work in progress. Many companies favored employing trained practical welders, if a major construction program was to be inaugurated, but the training of existing personnel, utilizing the trained welders as instructors, was recommended by all companies. A west coast company reports that the practice of making its own welders creates a better feeling within the organization and also gives an opportunity of observing carefully an employee before placing him in a responsible position.

The method of training these recruits likewise differs, for the size of the welding organization of the reporting companies varied from two, one welder and his apprentice, to 70, and the same type of training would obviously not fit both conditions. Welders may be trained by:

1. Self-instruction: Utilizing trade literature, books and bulletins from vendors of welding equipment.

2. Apprentice system: Assigning prospective welders to work with trained, experienced welders.

3. Company welding schools: Due to the number of welders employed and the turnover frequently experienced, it becomes necessary at regular intervals to train a group of men who are usually chosen from the operating organization.

4. Attendance at factory training schools: Some companies reported that attendance at factory schools was invaluable in their training program.

5. Attendance of welding conferences: Following is a partial list of schools and associations which have conducted welding conferences during the past year: Ohio State University, Texas Technical College, Iowa State University, Omaha Welding Conference, Purdue University, Polytechnic of Brooklyn, Armour Institute of Technology,. University of Kansas, and Western Metal Congress at Los Angeles.

6. Dependence on factory or sales representatives of welding equipment companies: One company did not find it advisable to have outside agencies contact employees.

Most companies rely on the apprentice system, since it does permit the constant training of embryo welders in all districts of the operating systems. Some exceptionally fine company welding schools are conducted. Outlines of instruction courses may be found in books on welding and bulletins furnished by the vendors of welding equipment. The American Welding Society has a list of codes, standards and specifications, which is available upon application to their headquarters. Supplementary instruction such as provided at welding conferences or by sales and service representatives tends to improve welding performance.

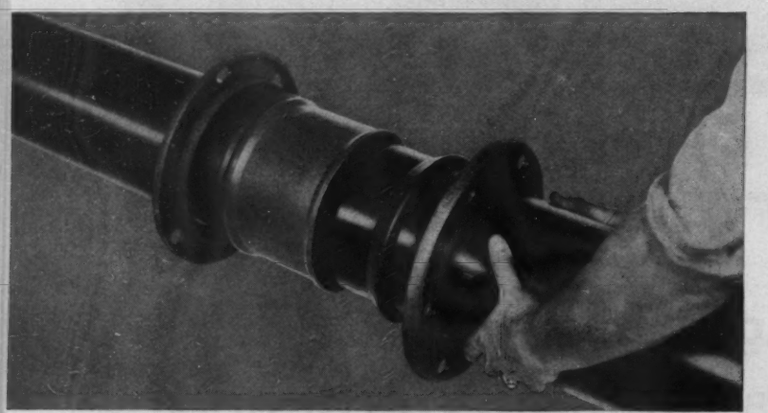
The participating companies were asked to comment on the advantages and disadvantages of company schools and even though company schools are not being utilized in most cases, there were many who believed that considerable advantage would accrue through more uniform quantity and quality of output, as well as imparting a knowledge of company policies and standards for specific jobs.

Some companies maintain a control, by having the welder stamp his number on the weld, of the individual welds made; other companies have a knowledge from work tickets of the men engaged in individual projects, and still other companies maintain no record of the work performed by the individual welders.

No standard practice of making a periodical check of welder performance seems to be in effect. One company reports, "No formal checkup is made but whenever faulty welding is found, it is used as a case example to be studied by each welder, who is asked to report why he thinks the trouble occurred, and how much trouble can be prevented in the future."

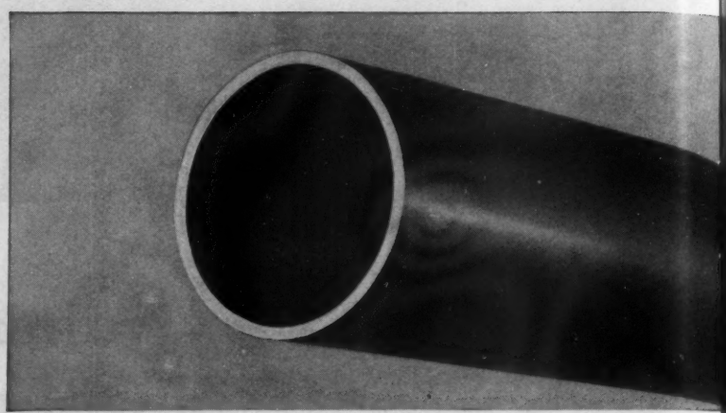
A company reports: "We attempt to check each welder's performance twice every year, though this frequency varies somewhat with the different classes of welders. We find that once a man has been classified and is devoting the greater part of his time to welding, there is no difficulty in his maintaining his performance. In many cases, however, welding is an incidental part of a man's employment, and we find that where a man gets relatively little practice

SIMPLIFY*



1 . . . STANDARD DRESSER PARTS ARE . . .

● The Dresser joint, like a pre-fabricated house, is made up of simple, standard, "factory-built," interchangeable parts. *No field fabrication is required.* All parts precision-made within close limits.

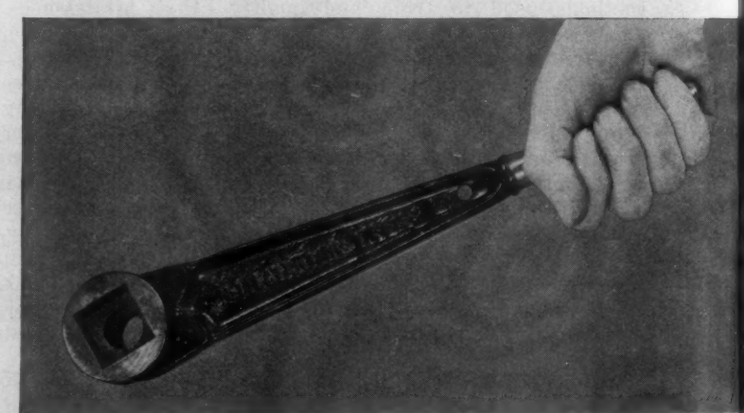


2 . . . ASSEMBLED ON PLAIN-END PIPE

● "Dressers" require no threading, drilling, grooving, nor reduction in wall thickness or strength; ideal for light-weight pipe; left-over lengths can be easily utilized. No damage to pipe ends during handling.

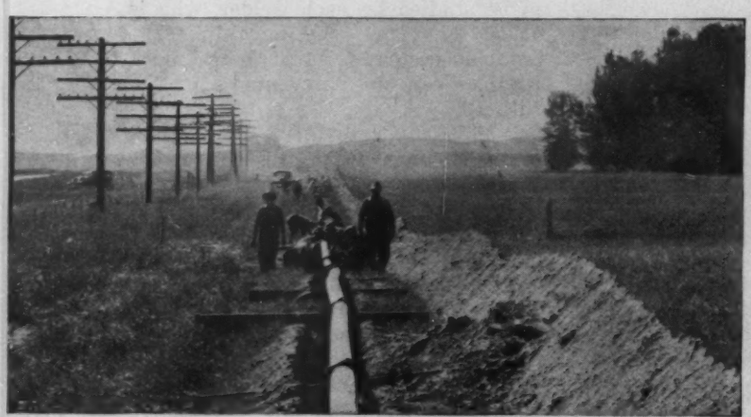
3 . . . BY UNSKILLED LABOR

● Inexpensive, unskilled labor, always near at hand, is used with "Dressers," eliminating the "human equation." Well-bunched crew is easily supervised; a mere handful of workmen needed.



4 . . . USING ONLY ONE TOOL

● With "Dressers" you need no complicated, costly machinery and equipment—which is not only hard to handle, but also expensive to operate, maintain, and transport.



5 . . . WITHOUT LOST MOTION OR LAG

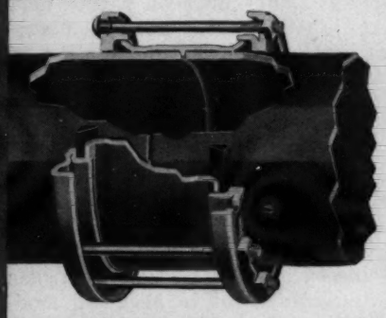
● Work moves forward in unison and without interruption on a Dresser-coupled line; no tedious alignment of pipe ends nor other slow joint-making operations hold up work; assembly practical from several points.

6 . . . UNDER ALMOST ANY CONDITIONS

● Snow, rain, ground-water, muck, swamps, etc., do not prevent making an "all-weather" Dresser joint; assembly is possible even under water, and/or in the dark, as on submerged line joined by diver.

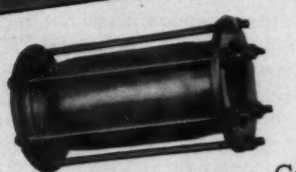
your Pipe-Line Work!

(Cutaway view of Dresser Coupling, Style 38)



*SIMPLICITY ...YES! ALSO:

1. PERMANENT TIGHTNESS—proved for 50 years, on 150,000 miles of pipe.
2. FLEXIBILITY—expansion, contraction, vibration, etc., are absorbed.
3. SPEED—typical examples: 4 min. for 5″ size; 6 min. for 8″; 8 min. for 14″ (two workmen).
4. STRENGTH—predetermined; joints safely withstand any specified pressure.
5. TRUE ECONOMY—a truly lower joint cost throughout life of line, plus salvage.



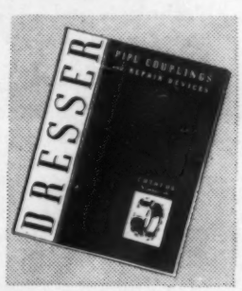
Dresser Long Sleeve (Long Coupling), Style 40, has longer body to span variations in space between pipe ends. Widely used for quick field hook-ups, closures, tie-ins, and cut-in work.

PIPE joints are the real "bottle-neck" of your pipe-line work. You know this if your own joint-making work has ever been held up by: (1) a single, slow operation; (2) dropping out of "key" workers; (3) difficulties in getting heavy machinery through swamps, etc.; (4) trying to supervise a crew spread out several miles; (5) delays due to wet ditches or bad weather.

You can get around all this by *simplifying* your joint-making operations!

With Dresser Couplings, most of the work is done before you start. All operations are standardized. Work goes forward uninterruptedly. You get "built-in" simplicity—which means *uniform,* fool-proof joints. Parts can go together in only one way—the permanently tight way! *Results:* all construction work is speeded up; costs are reduced; unforseen expenses, upset schedules, and uncertainties are eliminated.

For further details, write for our General Catalog No. 36, a virtual handbook on pipe joints. •S. R. DRESSER MFG. CO., BRADFORD, PA. *New York:* 230 Park Avenue; *Chicago:* Peoples Gas Building; *Houston:* Shell Building; *San Francisco:* 1038 Polk Street; *In Canada:* Dresser Mfg. Co., Ltd., 60 Front Street, West, Toronto, Ontario.



DRESSER

PIPE COUPLINGS

FIG. 2. Making welded fittings.

or production work, he must be watched more closely, to maintain a given classification.

The methods of testing welds vary from making a pressure test, using soapy water on all joints and visual observations, to the cutting of coupons which must pass tensile strength, free bend and back bend tests, and also be subjected to etching and microphotography. The fracture tests are but qualitative and should be resorted to only when more accurate methods of testing are not available. The possible defects to be observed in a fractured weld are:

1. Lack of penetration of such extent that the weld metal is not fused to the bottom of the vee nor to the lower portion of the side walls;
2. Laps or cold shuts in the body of the weld metal;
3. Slag inclusions;
4. Gas pockets.

Some welding supervisors rely entirely on observation of a fractured weld for determining the welder's efficiency but this practice does not conform to code requirements.

On To New Orleans

(Continued from Page 21)

Technical and Research Committee, under Chairman H. C. Cooper, Pittsburgh, Pa. New developments in transmission will be covered by executives and experts at a session under the chairmanship of A. L. Forbes, Jr., of El Paso, Texas. To mention a few, T. S. Bacon, Lone Star Gas Co., Dallas, will present a paper on "Combination Dehydration and Desulphurization;" W. M. Deaton, U. S. Bureau of Mines, Bartlesville, Okla., will speak on "Recent Developments in Gas Hydrate Study and Dew Point Apparatus;" and "Recent Improvements in Electric Welding on Pipe Lines" will be the subject of a paper by Hal Price, H. C. Price, Inc., Bartlesville. R. J. Kuhn, New Orleans, will present "Practical Application of Cathodic Protection," and Wm. Moeller, Jr., of Southern California Gas Co., Los Angeles, will talk on "Main Line Drips." An interesting motion picture will be shown of the laying of a submarine gas pipe line across San Diego Bay, Calif.

The important part industrial and commercial gas plays in the natural gas industry will be reflected in two Industrial Gas Sales and Utilization Meetings which will be presided over by Hale A. Clark of Detroit, Michigan, chairman, Industrial Gas Section and Franklin T. Rainey, of Columbus.

Among papers on the Production Committee Program under Chairman W. Jennings Young of Tulsa, will be "The Problem of Conservation" by L. B. Denning, president, Lone Star Gas Co., Dallas, Texas. "What the Oil Industry Is Doing About Conservation" will be the topic of Hugh M. Stalcup, Skelly Oil Co., Tulsa. D. T. MacRoberts, United Gas Pipe Line Co., Houston, will discuss "Latest Ideas on Availability of Gas Reserves and Well Spacing." "Utilization of Natural Gas From Oil Field Operations in California" will be presented by H. P. George, Southern California Gas Co., Los Angeles.

A "Home Planning Luncheon Symposium" will be presided over by Herman Russell, president of the Rochester Gas and Electric Corp., Rochester, N. Y. Mr. Russell is immediate past president of the American Gas Association, and it was in his administration that the Home Planning Appliance Bureau was established. This luncheon will be held in conjunction with the Members' Council, New Orleans Association of Commerce, and architects, builders and real estate board members will be invited to attend. The National Home Planning Campaign and the Architects and Builders Competition sponsored by the A.G.A. in cooperation with gas utilities, appliance and equipment manufacturers to promote the increased use of gas and gas burning equipment in new and modernized homes, will be fully discussed.

Liquefied petroleum gas sales methods will be developed in a special symposium. Advertising, accounting, and valuation problems have a prominent spot on the program.

The meetings and sessions have been arranged to give delegates time to see and to do while in New Orleans, which is a city, modern and progressive, antique and picturesque, romantic and historical, abounding in natural beauty and world famous for fine foods and varied recreation.

The Entertainment Committee has worked out a program that will appeal to the delegates and their ladies as well. Entertainment features of the four-day convention, not including the many special attractions afforded by New Orleans, itself, will be a moonlight ride and dance on the Steamer President on the Mississippi River, and a gala reception and ball at the Roosevelt Hotel.

■ ■

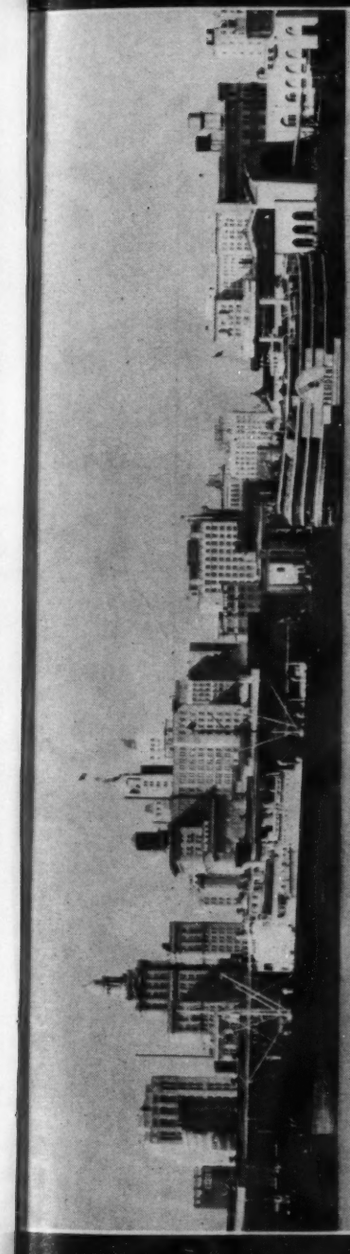
Cut In Common Shares Asked By Cities Service Co.

Cities Service Co., the $1,270,000,000 New York holding company, has announced that it will request shareholders to reduce the aggregate amount of outstanding common shares from 37,455,670 to 3,745,567, or in effect to exchange each 10 shares of common now held for one new share, according to Henry L. Doherty, company president.

■ ■

Ohio Co. in New Offices

The East Ohio Gas Co., Cleveland, Ohio, plans to move to new offices in Girard, Ohio. With the completion of the Griffith building in that community, local headquarters will occupy one side of the new structure which was expected to be ready for occupancy before May 1.



We'll be here to Welcome You!

— to the Natural Gas Association of A.G.A. meeting in New Orleans, May 9, 10, 11, 12.

Headquarters will be at the Roosevelt Hotel, come up and visit with us, we'll give you a friendly welcome and it's up to you whether or not we talk business.

The Webster Engineering Co.

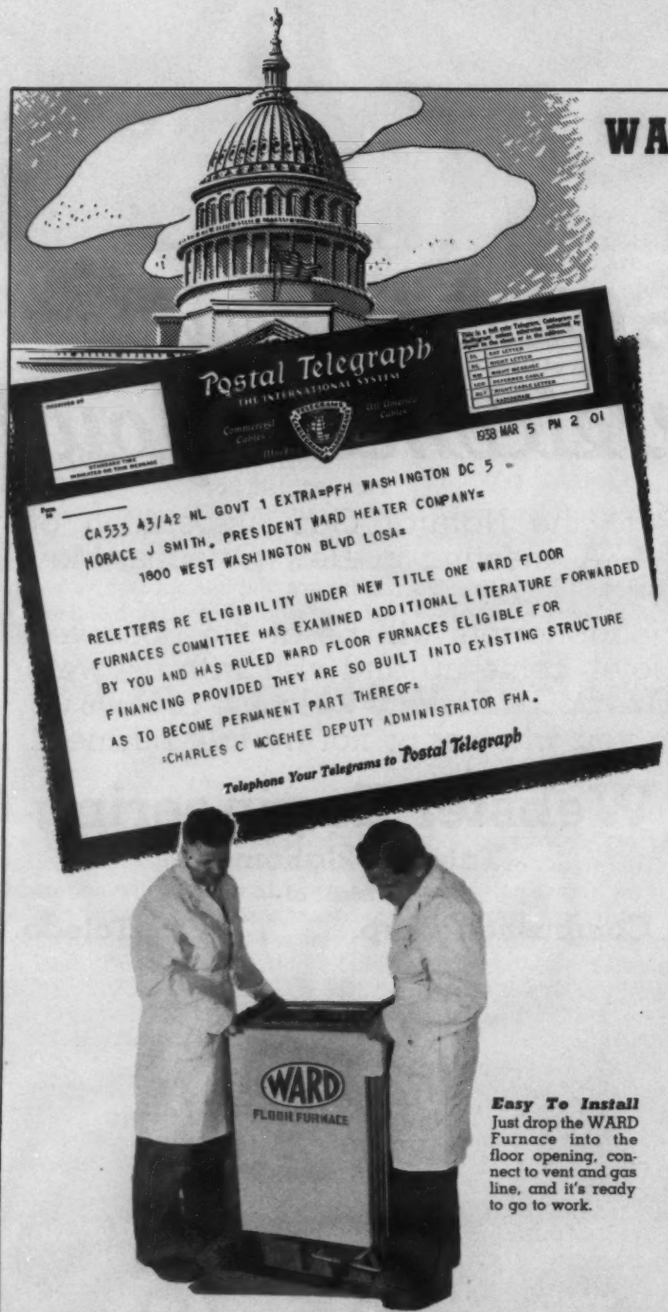
Tulsa, Oklahoma

— Division of —

Surface Combustion Corp. **Toledo, Ohio.**

AND NOW—AGAIN! IN 1938....

The Word for


Postal Telegraph
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HORACE J SMITH, PRESIDENT WARD HEATER COMPANY=
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FLOOR FURNACE

Easy To Install
Just drop the WARD Furnace into the floor opening, connect to vent and gas line, and it's ready to go to work.

WARD FURNACES ARE PERMANENT EQUIPMENT

so... from Washington, D. C., comes word that means sales for you!

Here's a telegram from the Federal Housing Administration that says WARD FLOOR FURNACES are eligible for financing under Title One "providing they are so built into existing structure as to become a permanent part thereof."

WARDS *are permanent equipment.* That's one of their big features...and that's a big reason why so many utilities have featured them in their merchandising programs. Once installed, a WARD FLOOR FURNACE stays in... building your load and protecting your load for many years to come.

Guaranteed for ten years...WARDS are built to last a lifetime. Among the 350,000 WARDS in use today, there are many that have given satisfactory service for twenty years or more... outlasting buildings in which installed. That's an important fact for any gas utility executive to consider.

With WARDS eligible for financing under Title One of the National Housing Act...they offer an increased opportunity for sales during the housing activity ahead. But even without that...and strictly on their own superior merits ...they are excellent heating equipment for you to put on your "sales staff"...because WARDS efficiently prove to your consumers *the convenience and economy of gas for heating.*

May we send you catalog and complete facts?

YOUR LOAD IS AS GOOD AS THE APPLIANCE YOU SELL!

Warmth is WARD

It's the only COMPLETELY AUTOMATIC FLOOR FURNACE!

WARD offers the only *completely automatic* floor furnace... the only floor furnace with all controls and accessories sturdily built in, *a part of the furnace itself.*

The only attention a WARD FLOOR FURNACE ever requires is when the pilot is lighted at the beginning of the heating season... and when the temperature gauge *in the corner of the floor register* is adjusted for degree of warmth desired.

Beyond that the WARD Floor Furnace practically "thinks for itself." Bilt-in Thermo-Control... a WARD-perfected thermostat... is inside the furnace and contacts all the air of the room as it flows through. It shuts off and turns on the burner *automatically* as needed accurately to preserve the desired heat level.

The WARD PILOT *automatically* watches pressure changes and shuts off gas flow immediately should flame be extinguished. It is a dependable guardian of the home... and has been proved in repeated tests to be amazingly sensitive and prompt in action.

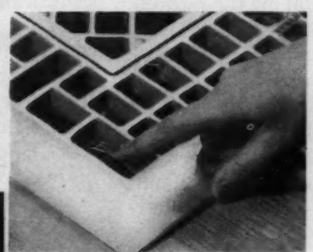
WARD principle of CRADLE CIRCULATION *automatically* keeps the air of the room in even, comfortable circulation and insures steady air flow that increases furnace efficiency as much as 20%.

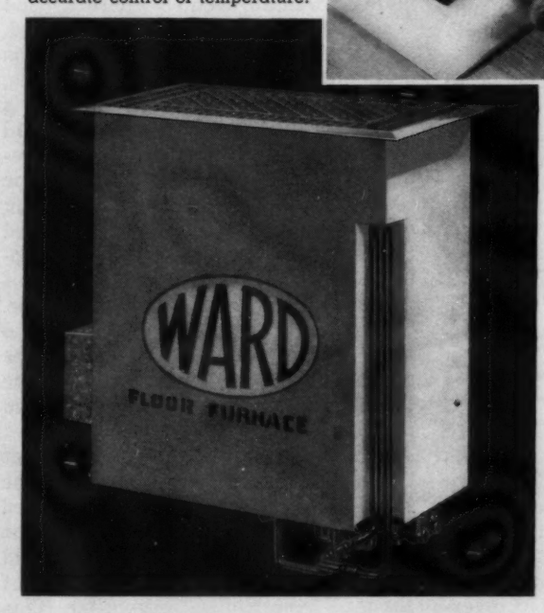
These and other superior features of WARD construction... perfected out of our twenty-nine years of manufacturing floor furnaces... combine to bring you load-building equipment that will win increased consumer good will and satisfaction with gas as the ideal fuel for heating.

May we tell you the whole story?

Built Into the Furnace!

The WARD thermostat is part of the furnace, with its regulating gauge in a corner of the floor register. No wires to run. No difficult installation. Bilt-in Thermo-Control gives unusually accurate control of temperature.





It Won't Be Long Now!

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Use of "Wrinkle Bending" On Overland Pipe Lines

● **EXCERPTS FROM an article, "Wrinkle Bending" published in the February, 1938 issue of "Oxy-Acetylene Tips" by The Linde Air Products Co., New York, N. Y. —(Abstract by G A S).**

A RELATIVELY new method for bending pipe has been developed which promises considerable economies in the field fabrication of overland pipe lines. This method, known as "wrinkle-bending," consists in heating with the oxy-acetylene flame one or more narrow bands at right angles to the pipe and extending about half way around the pipe. The pipe is then bent either by hand or by means of a tractor or bending rig until the heated sections buckle sufficiently to give the pipe the desired curvature.

Although the process has been known and practiced for over a quarter of a century, it is only recently that its use has become widespread.

Wrinkle bending is analogous to shop-fabricated creased bends, only the wrinkle or crease is not so pronounced. As a rule, each wrinkle is used to produce only a slight change in direction of the pipe. When the bend is more pronounced a series of wrinkles are used to give an easy flow, long sweep bend. The wrinkles project outward, thus providing a full opening throughout the bend. The method has found its greatest favor in mountainous country where, obviously, the greatest amount of bending is necessary, and where cold bending is difficult to handle because of the rough terrain and heavy equipment required.

Wrinkle bending is applicable from the smallest to the largest size pipe. Excellent results have been obtained on four- and six-in. pipe and equally good results have been obtained on the larger sizes ranging up to 22-in. The method is adaptable to both heavy wall and light wall pipe and can be performed in the shop as easily as it can in the field.

The advantages of wrinkle bending are many. Particularly important is that the pipe wall is never thinned from the original thickness. On the contrary, compression squeezes the pipe so that the metal at the wrinkle is actually slightly thicker than the original wall. The metal on the outside of the bend opposite the wrinkle retains its original thickness.

Wrinkle bending lends itself readily to correction, since too much bending in one or more wrinkles may be corrected simply by reheating and applying a reverse pull or sag. Furthermore, the pipe is not stressed as in cold bending because the bend takes place only at the point where the steel has been softened by heating. The facility with which bends are formed makes for the ready fabrication of gradual or long sweep bends that are so desirable in overland pipe line construction.

FIG. 1.
Preparatory to bending, two operators heat a narrow band at right angles to pipe.

Another important feature of wrinkle bending is that equipment costs, labor costs and material costs are all low. Also, the method permits bending even before the ditch is cut. Wrinkle bending fits in very well with the all-position or stab-on methods of welding.

Large degree bends even up to 180 degrees are readily fabricated by wrinkle bending. These may be made in the shop and then fitted on the job. Pumping station piping equipment is an example of this type of work.

Again, where the terrain is very rough and the pipe size very large, wrinkle bending can be carried out adjacent to the railroad siding where the pipe is being unloaded. The bent sections are then hauled out by the pipe stringing trucks and placed where needed. This is of special value in composite construction.

Small Pipe Procedure

As a rule, only one oxy-acetylene blowpipe is required for pipe under six-in. The large capacity blowpipes designed for heavy heating operations are particularly suitable for wrinkle bending. Additional equipment consists of either a manifolded supply of dissolved acetylene, or an acetylene generator, and a supply of oxygen. Usually, both gases are hauled along the right-of-way on a sled. Trained welding operators are not required, as the process involves only a simple heating operation.

In field fabrication, the bending or laying foreman decides where a bend is necessary. This may be a side bend, sag bend, or overbend. If the pipe is of small diameter, six-in. for instance, no additional bending equipment is necessary. The section of pipe is laid on skids across the ditch and the foreman marks the point at which the pipe is to be bent. The heaters, standing on each side of the pipe, then proceed to apply heat to this point around approximately one-half to two-thirds of the upper circumference of the pipe. The band of heat should be two to three in. wide at the top of the pipe and should taper down to zero on the two sides. The pipe should be heated to a bright red.

When the pipe is at the correct temperature, the section should be rolled over quickly so that the heated portion is on the underside. At the same time, one of the pipe gang should throw the skid on which one end of the pipe is resting into the ditch. This man should then press, if necessary, on his end of the pipe while the other end is being held securely by two additional men. The weight of the pipe itself is usually sufficient to form the wrinkle, and the man in the ditch

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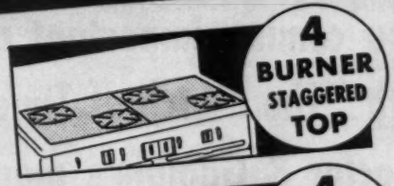
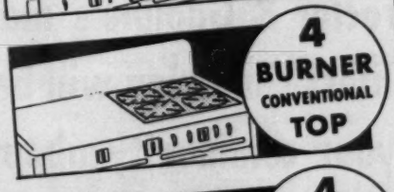
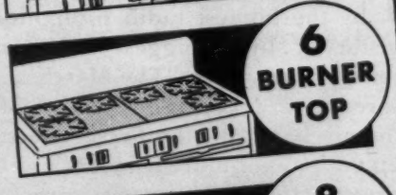
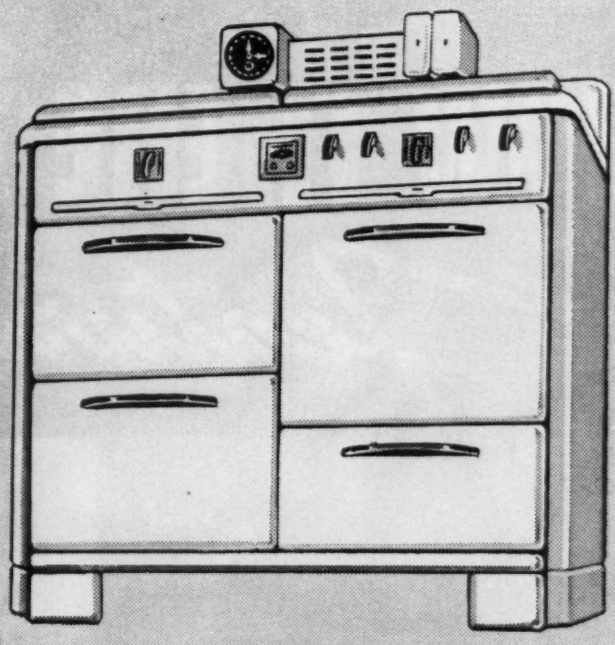






Give your customer the advantage of RoperSuper-De Luxe Gas Ranges with cooking tops tailored to her individual needs.



ONE OF THE MANY SALESWORTHY FEATURES OF

ROPER

GAS RANGES for 1938

A variety of top burner arrangements is only one of the many new features designed to give your customer the ultimate in a range. Look at these other outstanding features, in which Roper Ranges are exclusive or were the originators: "Turret" Top... "Simmer-Speed" and "Giant Simmer-Speed" Burners... 3-in-1 oven performance... "Lifetime" Cooking Chart... "Insta-Flame" Top Lighter... and other important improvements. Roper Gas Ranges are styled by E. D. Pellegrin, working with Roper engineers.

GEO. D. ROPER CORPORATION

GENERAL SALES OFFICE AND PLANT: ROCKFORD, ILL.

WAREHOUSES:

San Francisco Dallas Chicago Atlanta Los Angeles Kansas City
Newark Boston Washington Cleveland Philadelphia Roanoke

USE ROPER SALES PROMOTION PLANS

ROPER RANGES ARE IDEAL FOR USE WITH ANY TYPE OF GAS, INCLUDING BOTTLED GAS

NOW THERE ARE 2 *featuring*

Thru coming important months both "The March of Time" and Procter & Gamble's mammoth contest campaign will be telling your community about Gas Refrigeration and Gas Service

IN 1938, Servel Electrolux is being supported by the biggest radio promotion drive in its history . . . by the biggest radio campaign for *any* refrigerator. *First*—"The March of Time." Sponsored by Servel, this outstanding dramatic hit of the air is telling the Servel Electrolux story to 20,000,000 or more listeners a week, is building prestige for gas and gas service.

And *now*—the merchandising tie-up of the year! Commencing May 20, Servel Electrolux refrigerators will be prominently featured on Procter & Gamble's "Guiding Light" program, one of radio's foremost daytime shows. This program—a dramatic serial of human, real-life problems—plays a vital role in the promotion of P&G's nationwide white naphtha soap contest. It is backed by widespread magazine and newspaper advertising. And, beginning May 20, ten Servel Electrolux refrigerators will be given away each day as prizes.

What does Servel's participation in the contest mean to you? It means that millions every day, Mondays thru Fridays, will hear about this different refrigerator over 54 stations of the N.B.C. Red and supplementary networks. It means that millions will read about Servel Electrolux in seven of the nation's leading publications. It means that millions will read about Servel Elec-

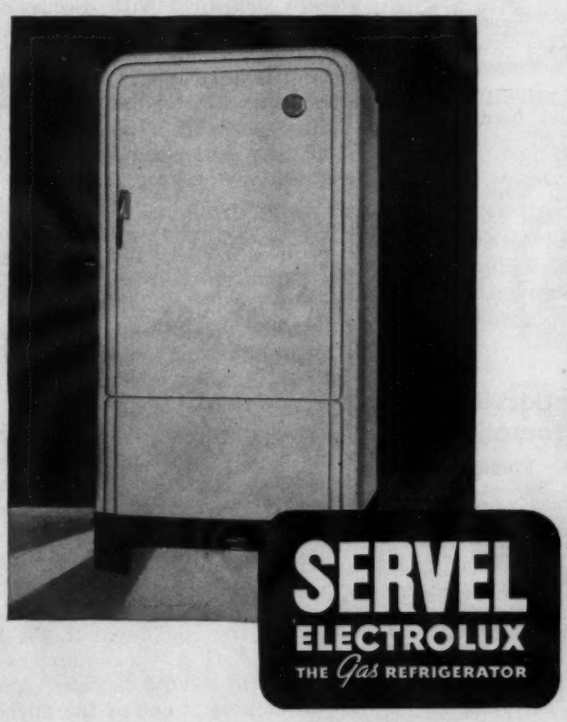
GREAT RADIO SHOWS
Servel Electrolux

trolux in local newspaper advertising by 300,000 grocers and chains from coast to coast. The "Guiding Light" program will reach an area containing 19,000,000 radio sets! Magazines will reach nearly 17,000,000 readers! Newspaper advertising will reach an inestimable total of additional readers.

Best of all, the contest is so designed that you will be able to bring these prospects *right into your own showroom.* Further details about this tremendous merchandising opportunity are being mailed. Watch for them.

And remember—for greater sales and greater gas load in 1938, tie in with *both* "The March of Time" and "The Guiding Light."

SERVEL, INC.
Servel Electrolux Sales Division, Evansville, Ind.



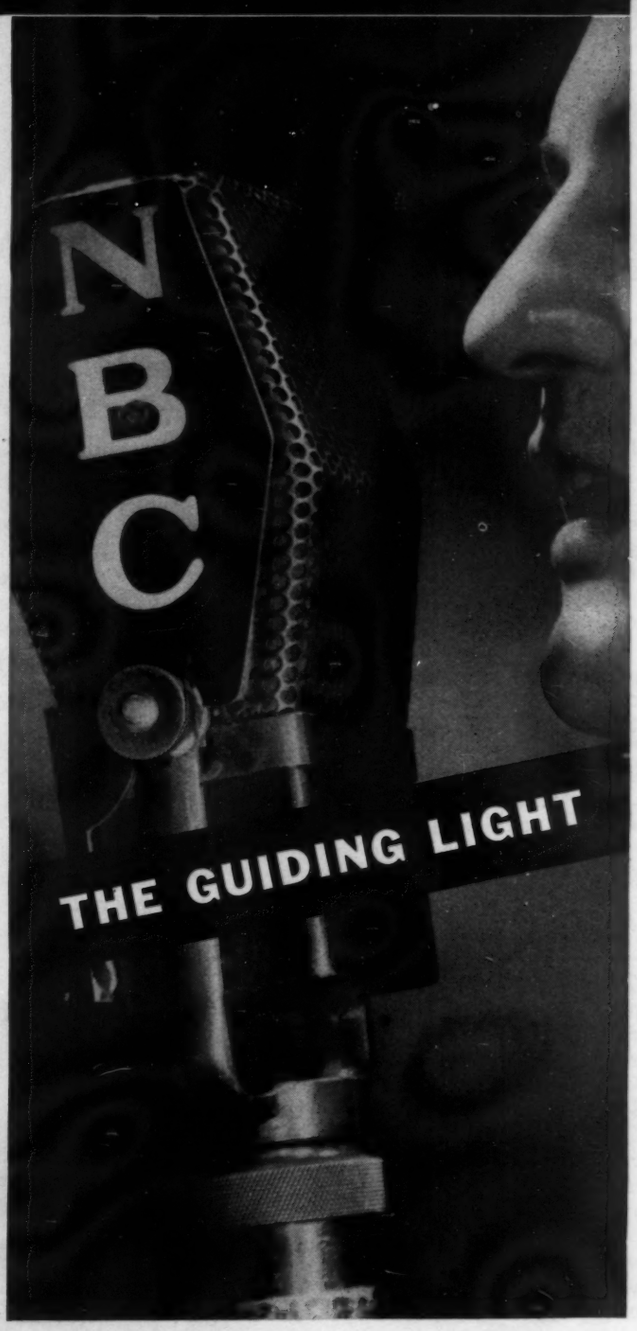


FIG. 2.

Thirteen wrinkles were required to give this pipe section its total bend of 35 degrees.

often finds his chief work in holding the sagging pipe to the requirements of the bend.

This operation is repeated until sufficient wrinkles have been formed to give the required bend. In general, a wrinkle of five to seven degrees should be the maximum to which the pipe is bent. A greater total bend is obtained by using more wrinkles. Wrinkles may be at any distance from one another depending on the angle of the bend and the diameter of the pipe, although it is more desirable to produce long sweeps wherever possible rather than short angle bends.

The entire procedure should not require more than two and one-half to three minutes. All three types of bend—sag, side and overbend—may be readliy produced in one section of pipe.

Bending Large Pipe

Two blowpipes should be used for pipe six in. in diameter and over. Also, additional bending equipment is necessary if the pipe is large or lying alongside the ditch or on the ground prior to ditching. A tractor, A-frame or bending rig can be used. If a tractor is used, it should be equipped with a stiff leg. The tractor should run part way on to the timbers which hold the pipe in place, the stiff leg set in position, and the chain block attached. The chain block in turn is fastened to the pipe. The pipe should then be heated in the usual manner with the two blowpipes and, when the proper heat is reached, the free end should be pulled up by means of the chain block.

Another method for handling this type of work is to use a tripod or A-frame equipped with block and tackle. One end of the pipe should be temporarily anchored, the heat applied, and the free end then hoisted to form the wrinkle. Still another method using the same equipment is to hoist the pipe first, place one or two men at one end to steady the pipe, and one or two men at the other end to press down. Heat is then applied on the underside of the section and the wrinkle is formed by the weight of the sagging pipe.

If the pipe is of the usual low carbon type, the bend can be arrested at any time by sudden cooling with water. However, this practice is not recommended for high strength pipe. In wrinkle bending longitudinally welded seam pipe, the heat should preferably be placed 180° away from the seam.

Where just a small angle is required, the wrinkle need not necessarily extend the full half of the circumference. The flexibility of the process permits the foreman to put in just the right amount of bend at just the right places.

■ ■

No. Illinois Public Service Co. Announces Promotions

L. C. Stephens of the Public Service Company of Northern Illinois recently announced new division appointments for the company. E. B. Millner is now acting as district superintendent for the Streator area. He replaces Elmer Malmquist who has been appointed gas superintendent, Harvey-Kankakee area. Mr. Stephens also announced the promotions of W. J. Brown to gas superintendent, Southern Division, and J. J. Dignan, gas superintendent, with jurisdiction over the Streator-Ottawa-Morris area.

Distribution Men Meet In Annual Conference

(Continued from Page 33)

scenes centers around the luncheon conferences and this year was no exception to the rule. Three of the conferences were held the first day, extending through the entire afternoon and many profitable ideas were presented.

W. A. Dunkley was chairman and Aaron Bush co-chairman, of the group centering attention around the installation and servicing of appliances. A phase of this discussion also dealt with year-round air conditioning. The supplemental testing of appliances by utilities in addition to the laboratory seal, the use of semi-rigid copper and aluminum tubing for range connections, appliance venting, and the use of regulators on individual appliances came before the group in the form of direct discussion.

Gas measurement, pressure regulation and pipe were topics which afforded grist for much discussion in another meeting headed by C. L. Nairne, New Orleans, and G. Heckendorn, Denver.

Meter standards were reported on by this group, especially in connection with the development of inspection forms for use in meter repairs. Meter manufacturers brought up costs, the elimination of peak loads on meter plants, and the desirability of reducing the variations in specifications of meters. The economics of locked meters also held much interest. The session concluded with discussion on pipe and related subjects, including use of copper pipe, locating and eliminating main trappages, coatings and couplings.

Employee training and classification and utility dealer cooperation held the attention of the group headed by T. J. Perry and C. S. Hazel. Training methods, courses and plans pertaining to utilities, dealers and plumbers held much of interest in this group. Semi-rigid range connections, systems for classifying employees and jobs, training for all-round service versus specialized training were also included in the program.

The chairman of each group reported back to the closing session of the conference held the third afternoon. There followed an open period for further discussion.

Charles F. Turner of East Ohio Gas Co., vice chairman of the conference, shared honors with Harold Gaidry in presiding the last day. H. W. Hartman of A. G. A. headquarters was ever present during the conference to aid in making it one of the finest.

Announcing

THE FIRST Winter Air Conditioner - Circulator to retail for LESS THAN $100*

**complete with filtration, and multi-vane blower*

This new RACE *portable* gas-fired, forced-air floor unit opens a vast, new market for dealers! Brings ultra-modern winter air conditioning and summer circulation to small homes and apartments — *to tenants as well as owners.* ★ Thermostatically controlled, with switch for summer operation. Fits any hall, closet or corner, occupying floor space only 13 x 20 inches. Beautiful design and finish, harmonizing with modern decorative trends. ★ Heats four to six rooms (7,000 cu. ft. space). Changes air four to six times per hour. ★ Also made with ducts for installation in closets, back porches, etc. ★ Unlimited potential sales volume and quick turnover for you. *Inquire today.*

SIZE: 45,000 B.t.u. input. ★ DIMENSIONS: 20 x 13 x 49". ★ FINISHES: Bone white, antique ivory, crackled mahogany, crackled walnut. ★ BLOWER: Same as our larger units, with balanced, multi-blade wheel. Quiet, double rubber-mounted electric motor. ★ FILTER: Highly efficient, removes all impurities—a health feature. ★ Directional flow, Venetian grilles; and many other advantages and sales points. *Ask for complete specifications.*

ROYAL AIR CONDITIONING EQUIP. CO.
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DISTRIBUTORS—DEALERS
Wire or Write for
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Race Gas FURNACES AIR CONDITIONERS

Race HEATS • VENTILATES • FILTERS • CIRCULATES • HUMIDIFIES Race

Modern Appliances Preserve Commercial Cooking Profit

● **PRESENTED HEREWITH are excerpts from two papers dealing with the modernization of commercial cooking appliances. These papers were offered before the Spring Sales Conference of the Pacific Coast Gas Association at its meeting in Los Angeles, Calif., on March 24 and 25, 1938. Titles of the papers are, "Modernizing Secondary Commercial Cooking Appliances," by J. H. LEWIS, Robertshaw Thermostat Co., Los Angeles and "Deep Fat Fryers," by NOBLE KING, Southern Counties Gas Co., Los Angeles.—(Abstracts by GAS.)**

Coffee Urns and Steam Tables
By J. H. Lewis
Robertshaw Thermostat Company

IN these days of rising costs and declining profits, the hotel and restaurant manager is often faced with problems seriously affecting his future success as a business man. Upon investigation and analysis of the situation, he will be compelled to look to his equipment. Antiquated equipment means high costs, because it is wasteful to use and difficult to operate. Modern equipment, automatically controlled, eliminates waste and is easy to use, resulting in economical operation, satisfied help and satisfied customers.

Take, for example, the preparation of coffee. The latest step, in modernization of the coffee urn is for automatic control of the temperature by means of a thermostat, which will control the temperature to the proper predetermined degree. It will automatically regulate the flow of gas to the burner to keep the water in the urn at or just below the boiling point. To permit the water in the urn to boil violently is a waste of fuel, and represents good dollars vanishing in the vapor.

Following are some of the benefits to be obtained through use of the thermostat. These data should be used to good advantage by salesmen and manufacturers in the industry.

1. By carefully metering gas consumption for a 30-day period before and after the installation of thermostats in coffee urns, it was found that the reduction in fuel was a little over 50 per cent.. Practically the same amount of brewed coffee was served in each period.

2. The installation of thermostats in coffee urns resulted in a reduction of gas consumption of 28 per cent; reduction in new coffee used 22 per cent; reduction in cream, 18 per cent.

3. After installation of thermostats in a number of urns, it was found that the saving in cream alone in a 90-day period paid for the thermostats. Less gas was consumed and coffee was more palatable.

4. A reported saving of 10 per cent in gas consumption on urns equipped with thermostats.

These data lead to the following conclusions:

1. The fuel consumption being less by virtue of its more efficient use means lower costs and a more contented operator.

2. Reduction in quantity of coffee used is made possible by maintenance of the proper temperature. If the coffee is allowed to boil it becomes bitter and unsavory and will be wasted.

3. Saving in coffee cream is appreciable. If the coffee is bitter, a customer wants more cream to offset the unpalatableness of it. Also, some customers predetermine the taste of the coffee by the color of it.

4. An important factor is the maintenance of improved working conditions in which the restaurant help operate day in and day out. The steamy condition around the coffee urns is unnecessary, and can be eliminated by proper fuel adjustment. Contented help means better relationship between employer and employee.

Advancing now to the subject of steam tables, a better term would be "Food Warming Table" or just "Warming Table." It is an appliance used to keep food warm after it has been cooked.

The ordinary "Warming Table" is usually a galvanized iron or copper tank, holding a quantity of heated water shallow in depth. Food is placed in individual receptacles immersed in the hot water. The four sides and bottom of the tank are, in many instances, encased by a galvanized iron sheath. Very seldom is a tank adequately insulated to avoid heat loss through radiation. The operating result of such equipment is, therefore, very inefficient. Gas consumption is high because much of the heat is radiated throughout the kitchen.

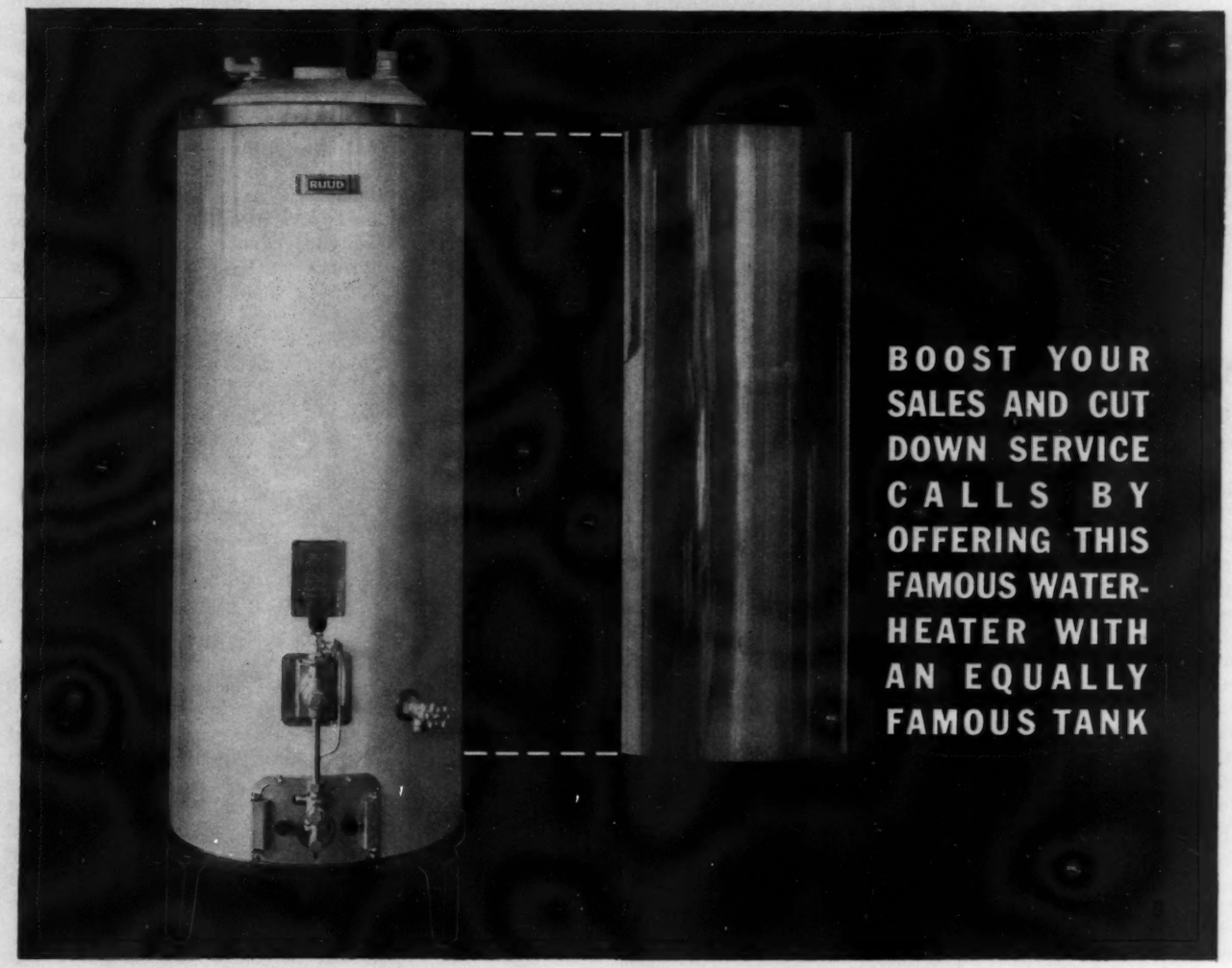
The answer to many inquiries as to why so much inefficient equipment is made and allowed to exist is "first cost." A reason for this condition is that there is so much resistance set up by the small shop which will take a job on a sheet metal basis. This situation is deplorable, and is, in a way, a reflection upon those dependent upon the utilization of gas for a livelihood. The "warming table" installation represents a nice fuel load, and a movement should be put forth to have better "warming tables" made and to give every encouragement possible to the dealer in hotel and restaurant equipment to make a few installations which will convince the user that an insulated and thermostatically controlled "warming table" will result in material and physical economies. One of the economies will be a saving in gas. On installations in the east, this saving has ranged all the way from 10 per cent to 60 per cent.

On modern warming table installations the thermostat has reduced waste of fuel and food. Uncontrolled temperatures may also account for over-cooking of the food in the "warming table." The dollar-saving made by the addition of the thermostat would pay for the installation of the instrument in a comparatively short time, and that saving would become net profit to the hotel operator.

To convince the skeptical that this job can be done, consider that a few years ago the gas range with insulated oven and automatic-temperature controller was an innovation and untried. Some were made and put on the market. Quite naturally, there was sales resistance because of the additional price, but it did not take the public long to realize the advantages and benefits to be gained, and to learn that the manufacturer was actually doing something for them. Therefore, with concerted effort, the industry can impress the manufacturer and dealer of restaurant equipment of its desire to cooperate with them in the production of better and more efficient "warming tables."

What competition is offered by the electric warming table? The first cost of the small size table is about two and a half times that of the same sized gas-fired table. Furthermore, the operation and maintenance of the electric warming table is not going to be as easy and free of trouble as one may think. The average small size table of either the electric or gas fired type would consist of four round food receptacles and two shallow pans. In the case of the electric table, this means there are six receptacles, six heating elements and six controls to be manipulated, and that many chances of something going wrong. In the gas fired table there would be six receptacles, one heating unit and one control. The heating unit and control are standard and proven equipment. In other words, there are 12

NOW ...THE FAMOUS RUUD GAS WATER HEATER ...



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Great news for your customers . . . great news for you. Ruud Gas Water Heaters, well known for their trouble-free, economical performance, now offer even greater freedom from trouble, longer life: With the popular, efficient Ruud Gas Water Heater is now combined the equally popular, long-lived tank . . . Monel.*

Known to millions from coast to coast, Ruud Gas Water Heaters have won preference because of mechanical excellence. And Monel tanks, known to homeowners the country over, are also widely acclaimed . . . because they assure a dependable supply of *clean* hot water for years to come.

Display Ruud Gas Water Heaters and tell your customers about these important *additional* advantages: Never a spot of rust from the tank because Monel *cannot* rust . . . years of trouble-free service, because Monel, tougher and stronger than the steel used for bridges, fights off corrosion and thus retains its strength . . . and in addition, there's a guarantee against rust and corrosion that is *provided with no other tank . . . good for twenty years.*

Boost your sales, and at the same time increase your list of satisfied customers. Display Monel-equipped Ruud Gas Water Heaters. Get started today by writing for further information. Address:

THE INTERNATIONAL NICKEL COMPANY, INC.
67 WALL STREET NEW YORK, N. Y.

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*Monel is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. This alloy is mined, smelted, refined, rolled and marketed solely by International Nickel.

MONEL

heating and control units to operate and maintain in the electric table as against two in the gas table.

The temperature requirement to keep food warm and ready for service would be about the same for all cooked foods, therefore, there can be no advantage in having individually controlled food receptacles. One temperature, say 180 degrees, would suffice. However, it would be a comparatively easy matter to build a gas fired warming table with partitions in it to make compartments for varying operating temperatures, each of which would be fired by its own burner and controlled by its thermostat. As a matter of fact, such a construction is now being considered by a manufacturer in Los Angeles.

Deep Fat Fryers By Noble King Southern Counties Gas Company

ABOUT 1920 an Eastern manufacturer conceived the thought of building a self-contained, thermostatically controlled deep fat fryer, built upon a stand, giving it the proper height, so that it could be placed in or alongside a battery of ranges. A ring burner was placed directly beneath the pot. The bottom of the pot was conical, the cone itself extending through the center of the ring burner for a distance of three or four in. At the bottom of the cone a one-in. draw-off with a gate valve allowed the fat to be drawn from the pot for cleaning.

Here was an appliance which not only should add new load, but should also give the ultimate in consumer satisfaction. By thermostatically controlling the fat temperature, never allowing it to go over 410° F. there should be a saving in fat, which would pay for the appliance within a year. Sad to relate, this is not what happened. Most operators reported no saving in fat, the thermostat proved hard to set and to service. The gas industry's enthusiasm dropped to a minimum.

Finally, about 1932, a new fryer by the same manufacturer made its appearance, and enthusiasm was revived. Instead of applying the heat at the bottom of the container, a number of tubes were set in about the center of and extended horizontally through the fat container. A Bunsen burner was fired into each tube and a common vent at the back handled the products of combustion. The fat above the tubes was controlled at whatever cooking temperature was desired and that below the tubes remained cold, never reaching over 125°, regardless of the temperature of the fat above. The thermostat really worked and was easy to set at any desired temperature, as well as being as service free as the average appliance. The food particles become detached and settle into this quiet space below the tubes and remain there until drained off. This eliminates the transfer of taste to such an extent that you may first fry fish, then potatoes, then oysters, then chicken, in the same grease or actually at the same time and there is not the slightest taste transfer. An actual saving in the length of time the fat can be used must be attributed to the cold zone, because with this new design the fat could be used from four to seven days, depending on the temperature used and amount of food cooked.

While this fryer was a tremendous improvement over the old type, the manufacturer decided to improve the performance again by the introduction of a new burner which was placed in a combustion chamber at the front of the fryer, the tubes being indirectly heated from the combustion chamber. This was a further improvement, the fat lasting several days longer with the same usage. This last construction mentioned is the standard design of all good fryers on the market today.

As explained previously, the detached food particles instead of continuing to circulate or coming to rest on a highly heated surface now sink into and remain in the cold zone, from where they are drawn when the fryer is cleaned and are filtered from the fat before it is returned to the fryer.

Why, then, doesn't the fat last indefinitely or until it becomes rancid, instead of breaking down from carbonization? The frying fat never goes over 410° maximum and general frying temperatures vary from 360° to 390°. What then, is the temperature at which cooking fats break down or start to carbonize? Such an inquiry made to the chemist of one of the large packing houses elicited this information: *Vreem, Formay, Primex* and other high grade hydrogenated vegetable oils begin to carbonize at from 430° to 460°; second grade hydrogenated vegetable oils at from 400° to 425°, lard at about 380°, and beef suet between 300° and 380°.

Why do we get carbonization when even high grade fats are thermostatically controlled at a maximum of around 400°? The reason is that the transmission of heat from the tube or element to the cooking fat takes place through a thin film which is constantly changing but in which temperatures up to nearly the temperature of the heating element may be reached. If this heating element is beyond the carbonization point, minute amounts of fat will be continuously carbonized and, leaving the element, will remain in almost collodial suspension in the fat. These particles in suspension are in most cases so minute as to defy filtration by the crude methods available to the average operator. Eventually this continuous increase in free carbon present in the grease makes the grease unusable. Probably the increased transfer of taste as grease becomes older is due to adherence of odors to these tiny carbon particles and the adherence of those particles to new food being cooked. This necessitates the replacement of the grease at intervals evidently dependent on the maximum temperature of the heating element.

The following information was gathered as a result of tests:

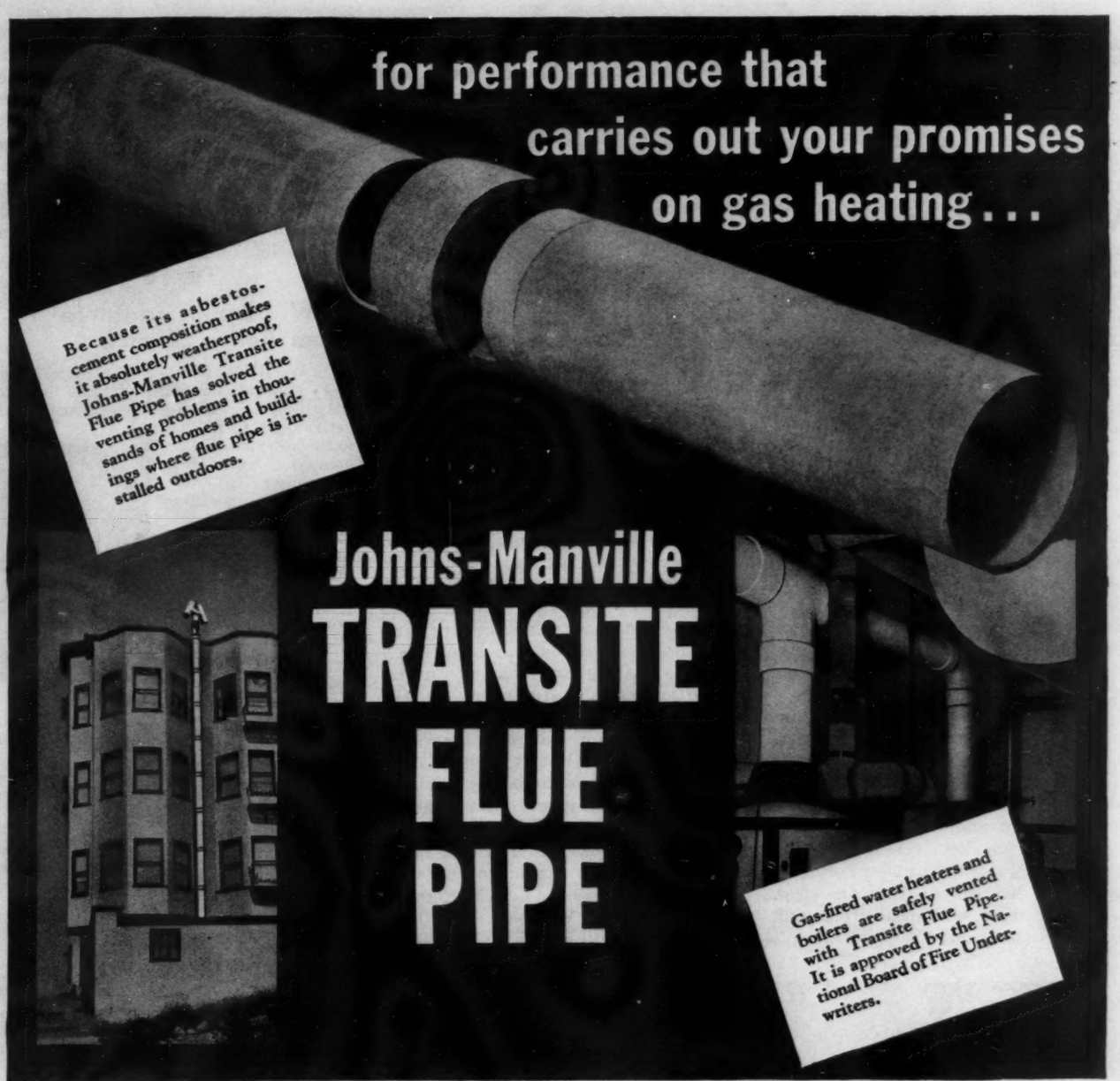
	Tube Temperature	*Fat Temperature*
Gas fryer No. 1	510°	375°
Gas fryer No. 2	480°	375°
Gas fryer No. 3	480°	340°
Gas fryer No. 4	480°	390°
Gas fryer No. 5	500°	390°
Gas fryer No. 6	500°	390°

The reason that gas fryer No. 3 was not brought to a higher temperature was because of the type of fat being used. Undoubtedly, if the fat had been brought to 390°, the tube temperature would have reached or passed 500°. Gas fryers Nos. 5 and 6 were flat bottomed utensils placed directly over the flame, the former of light construction and the latter of heavy construction.

About the same general curve was followed in all the fryers in the heat build-up, as for example, fryer No. 1:

Time	*Tube Temperature*	*Fat Temperature*
2:15	270°	hard grease
2:17	370°	85° melting
2:20	410°	160°
2:23	410°	205°
2:25	450°	225°
2:26	460°	255°
2:27	470°	270°
2:28	480°	285°
2:29	490°	310°
2:30	500°	340°
2:31	505°	355°
2:32	510°	375°

The future development of gas deep fat fryers must tend to lower temperatures of the heating element, but at the same time retain the speed so necessary for chef acceptance.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carries out your promises
on gas heating...
Because its asbestos-cement composition makes it absolutely weatherproof, Johns-Manville Transite Flue Pipe has solved the venting problems in thousands of homes and buildings where flue pipe is installed outdoors.
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PIPE
Gas-fired water heaters and boilers are safely vented with Transite Flue Pipe. It is approved by the National Board of Fire Underwriters.

Permanent, non-corrodible, weatherproof ... and surprisingly inexpensive

FOR gas heating you can rightly promise more convenience, greater dependability. To make sure its performance carries out these promises, the appliances and equipment used should be in the permanently trouble-proof, maintenance-free class.

Ending repair and replacement of corroded flue pipe and chimney linings is a matter of specifying J-M Transite Flue Pipe on all installations.

An asbestos-cement product, Transite Flue Pipe is remarkably resistant to corrosive fumes and condensates. Furthermore, Transite's low heat conductivity keeps stack temperatures at a high level for longer distances, minimizing condensation in the flue. Like all asbestos products, it is unusually resistant to high temperatures.

Supplied in both round and oval form, in various capacities. A full line of fittings is available. Costs, considering Transite Flue Pipe's established superiority, are surprisingly low. Installation simple and quick. And it's approved by the National Board of Fire Underwriters.

Specifications and information about installation methods, including use of Transite for chimney linings, are given in our brochure. Send coupon for your copy.

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G-5-38

A. G. A. E. M. Holds Annual Convention This Month

MANUFACTURERS from all parts of the country will gather at the Greenbrier Hotel in White Sulphur Springs, West Virginia, for the annual convention of the Association of Gas Appliance and Equipment Manufacturers, May 25, 26 and 27.

The program committee under the direction of John A. Fry, president, Detroit-Michigan Stove Co., has planned the schedule of events. Merrill N. Davis, A.G.A.E.M. president, will open the first general session, May 25, with a welcoming address to association members and their guests. Mr. Davis will be followed by N. C. McGowen, president of the American Gas Association, who will describe the cooperative relationship existing between the two associations and how together they are increasing the distribution and sale of gas and gas appliances.

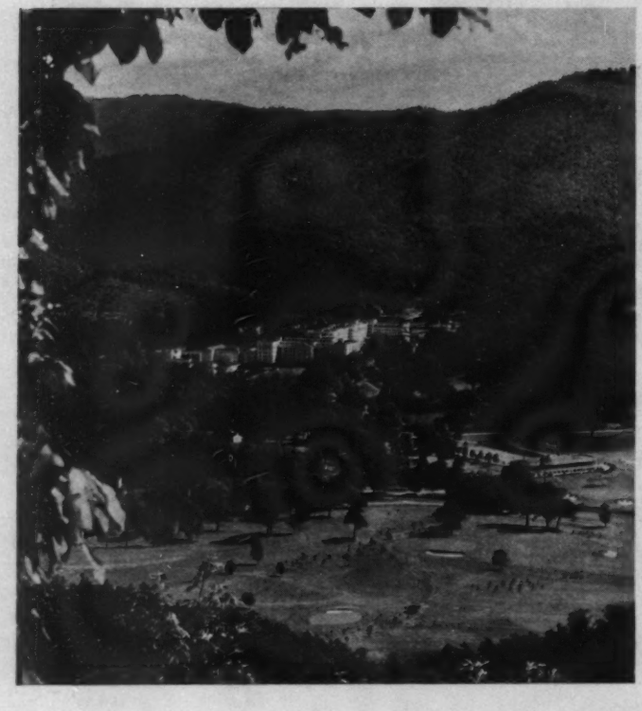
C. W. Berghorn, A.G.A.E.M. managing director, reviewing the association's activities during the past year, will report at the first session on the sales promotion projects which have been launched and the statistical analysis and market research being carried on. Major Alexander Forward, managing director of the American Gas Association, will speak, following Mr. Berghorn, on his association's activities and the work that is being conducted in cooperation with the A.G.A.E.M.

Hugh H. Cuthrell, president, Gas Exhibits, Inc., will report to the opening session on the exhibit group which the gas industry is planning for the exposition, including details of the distribution system which will take care of the heavy gas consumption at the Fair, and the dramatic use which will be made of gas.

Guest speakers at the convention will include Bruce A. Wilson, director of the Division of Education of the Federal Housing Administration, who will discuss the program which the government is conducting to stimulate reconstruction and modernization of homes throughout the country and how that undertaking may be of benefit to the gas appliance manufacturers. Activities of manufacturers on the Pacific Coast will be reviewed by R. G. Logue, vice-president of the Ward Heater Co., Los Angeles, Calif.

This year's nationwide gas refrigeration campaign, sponsored by the A. G.A.E.M. in cooperation with the A.G.A., will be discussed by F. E. Sellman, A.G.A.E.M. treasurer and vice-president of Servel, Inc. H. N. Ramsey, president of the Welsbach Co., Gloucester, N. J., will report on the "Prize Parade," the current promotion campaign being carried on by the association for the sale of gas water heaters.

H. P. Mueller, Milwaukee, Wis., chairmain of the association's Gas Househeating and Air-conditioning Equipment Division, will discuss the sales of gas home heating appliances.



A panoramic view of the Greenbrier Hotel at White Sulphur Springs, West Va., where members of the Association of Gas Appliance and Equipment Manufacturers will meet for their annual convention.

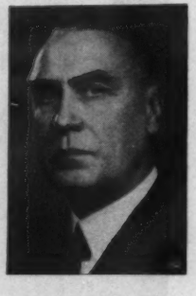
The C. P. Gas Range Program, soon to be launched by the association, will be outlined by W. E. Derwent, vice-president of the George D. Roper Corp., Rockford, Ill.

Representative Bruce Barton, of New York, who, through his one-man campaign to "repeal ineffective and obsolete laws" is receiving nationwide attention, will be a chief speaker at the closing general session.

■ ■

C. W. Bennett To Retire From Active Service

C. W. BENNETT, vice president and general manager of the Detroit City Gas Co., Mich., has announced his retirement from the active service of the company effective November 1, 1938. He will, however, continue in the service of the company in a consulting and advisory capacity.



C. W. BENNETT

For 45 years Mr. Bennett has been actively associated with the gas industry. In 1916 he started guiding the destinies of the Detroit City Gas Co. and has continued throughout the period of its most rapid expansion.

A director of the American Gas Association, and a past director of the National Commercial Gas Association, Mr. Bennett was also a member of the Utilities Information Bureau of Michigan for a number of years and is now an active member of the Michigan Gas Association.

■ ■

Airlene Gas Co. Plans Expansion Program

The Airlene Gas Co., Mayfield, Ky., has entered western Kentucky and Tennessee territory where the company sells underground systems for the use of liquefied petroleum gas.

Plans are now under way to move the main office to Dyersburg, Tenn., where a group of installations has already been put in operation, with the erection of a large bulk storage tank to take place in the immediate future. In southwestern Kentucky a bulk storage tank which will serve eight counties now using liquefied petroleum gas, is now under construction. When present plans are complete, a third tank will be added in new territory.

Robert A. Stevens of Dyersburg is president, H. S. Raymond, formerly of Tulsa, Okla., is vice-president and manager, Craig Miller, Memphis, Tenn., is secretary-treasurer, and J. G. Lord of Dyersburg is sales manager.

■ ■

J. W. West Jr. Returns to Duty

John W. West, Jr., secretary of the Commercial section, American Gas Association returned to his desk April 1 following a six-months' absence caused by illness. A victim of overwork, Mr. West's condition became critical for several weeks' duration last Fall.

Set Your Stage FOR PROFIT

WITH THE NEW

Magic Chef STYLE SHOW

An advance "Style Show" always draws a crowd. To make money on ranges this spring, bill Magic Chef's five brand-new 1938 models. Smartly streamlined, in the modern "built-in" style, you can spotlight these gas ranges to real advantage.

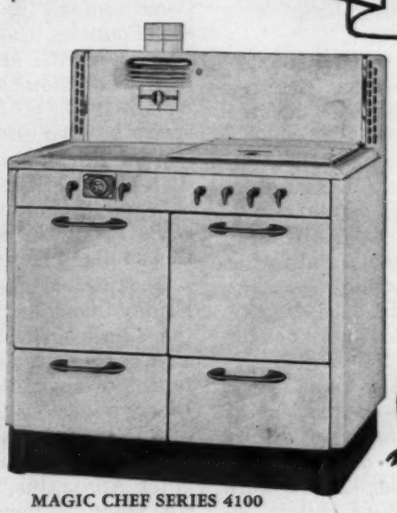
They're beautiful in design . . . flawless in performance. Features are advanced. No other range provides a Swing-Out broiler and High-Speed oven. There's a new Super-Duty burner, too, for faster top cooking, and Hi-Lo valves for simmer touch control.

These ranges are famous. Full page advertisements in leading national magazines are telling American homemakers for the 20th consecutive year about Magic Chef. For your local tie-in, a complete merchandising program is ready, free of charge. Included is every advertising and sales promotion help you'll need to hang the S.R.O. sign on your 1938 range show.

Don't let competition get the jump. Sign up the Magic Chef "Style Show" NOW for an early appearance.

BOOK THE MAGIC CHEF "STYLE SHOW" FOR YOUR SALES FLOOR

MAGIC CHEF SERIES 4000



MAGIC CHEF SERIES 4100

AMERICAN STOVE COMPANY

BOSTON • NEW YORK • ATLANTA • PHILADELPHIA • CLEVELAND
CHICAGO • ST. LOUIS • SAN FRANCISCO • LOS ANGELES

P. C. G. A. Technical Men Hold April Meeting

WITH registrations approaching the 200-mark, the two-day Spring Technical Conference of the Pacific Coast Gas Association was called to order by Technical Section General Chairman Arthur B. Allyne of the California Railroad Commission at 9:30 a.m. on the morning of April 7, 1938. Mr. Allyne's remarks to the general session were devoted to a technical section progress report, after which the delegates divided themselves into three groups to attend Transmission, Distribution, and Utilization committee meetings.

A. B. ALLYNE

First meeting of the Transmission committee, under Chairman F. E. Wilson of the Pacific Gas and Electric Co. was devoted to a report of the Sub-committee on Large Volume Measurement of which G. B. Reece, Southern Counties Gas Co. was chairman. Principle offerings at the meeting were made by M. J. Cereghino, Southern California Gas Co. and F. H. Winslow, Southern Counties Gas Co., whose topics respectively were "Operation and Maintenance of Orifice Meters" and "Testing Large Volume Displacement Meters."

Under Chairman H. G. Laub, Southern California Gas Co., the Distribution committee meeting was devoted to a report of the Special Problems Sub-committee with Frank Wills, Pacific Gas and Electric Co. as chairman. Papers presented were "Odorization by Integrating Orifice Gages" by C. F. Briscoe, Southern California Gas Co. and H. C. Caldon, Southern Fuel Co. (*G A S*, April, 1938, p. 28), and the "Application of Thermometer Calibration" by B. M. Laulhere, Southern California Gas Co.

Two papers featured the meeting of the Utilization committee under Chairman R. I. Snyder of the Southern California Gas Co. These were "Operating Efficiency of Pilots on House Heating Equipment," by J. P. Dresen, Public Service Co. of Colorado (*G A S*, April, 1938, p. 56) and the report of the Sub-committee on Inspection of New Appliances by Chairman C. A. Renz, So. Calif. Gas Co.

The three groups continued their meetings in the afternoon with the Transmission men hearing the report of the Sub-committee on Compressor Plants with A. B. Newby, Southern California Gas Co. as chairman. The report included a discussion of "Effect of Large Valve Areas on Compressor Performances," by W. C. Collyer, Ingersoll-Rand Co. and "A Study of Pressure Drops in Compressor Stations" by O. A. Philpott, Pacific Gas and Electric Co. C. F. Briscoe's Subcommittee on Pipe Protection offered a paper, "Insulation of Structures Connected to Cathodically Protected Pipe Lines" by H. J. Keeling, Southern Counties Gas Co. (*G A S*, April, 1938, p. 53).

The Distribution committee meeting continued with the report of the Sub-committee on Construction and Maintenance under Chairman C. P. de Jonge, San Diego Consolidated Gas and Electric Co. The three papers presented under this sub-committee by F. R. Bater, N. L. Hoff, and N. K. Senatoroff were preprinted in *G A S*, April, 1938, pp. 42, 32, and 37 respectively. The report of the Subcommittee on Measurement and Regulation offered a paper, "Design of a Remote Control Pressure Regulating Station," by W. A. LaViolette, Pacific Gas and Electric Co.

"Application of Gas to Summer Air Conditioning," by Glen Miller, Southern Counties Gas Co. was the first address on the afternoon program of the Utilization committee (*G A S*, April, 1938, p. 57). This was followed by two sub-committee reports, one on the Architects Data Book by F. L. Moon, Southern California Gas Co. and the other on Appliance Installation by C. E. White, San Diego Consolidated Gas and Electric Co.

Group meetings were continued on Friday morning, the second day of the Conference, with the Transmission committee delegates hearing the report of the Sub-committee on Pipe Lines under Chairman R. T. Peterson, Pacific Gas and Electric Co. Two papers were discussed: "A New Dewpoint Apparatus," by Armor B. Martin, Montana Power Co. (*G A S*, April, 1938, p. 46) and "Gas Temperatures in Pipe Lines" by J. B. Reddick, Southern California Gas Co.

Employee Training was the topic under consideration by the Distribution committee at its Friday morning meeting. Three papers were presented: "Employee Training in Butane Plants," J. K. Koeneman, Southwest Gas Corp. (*G A S*, February, 1938, p. 70); "Training for Industrial Servicing," W. C. Dodder, Southern California Gas Co., and "Gas Engine Servicing" by C. L. Ferry, Southern Counties Gas Co. (*G A S*, April, 1938 p. 44).

A meeting of the Production committee was also held on Friday morning, under Chairman J. E. Kelley, Pacific Gas and Electric Co. The meeting was devoted to a report of the Sub-committee on Butane Plants, and featured a paper, "Butane-Air Standby Plant for Emergency Use," by M. C. Gould, mechanical engineer. A. R. Bailey, Coast Counties Gas and Electric Co. was the Sub-committee chairman.

Friday afternoon was devoted to a general session, with the presentation of reports and papers of interest to all delegates. These included the report of the Research committee with Guy Corfield, Southern California Gas Co. as chairman; "Geophysical Prospecting for Oil and Gas Reserves" by Dr. J. J. Jakosky, International Geophysics, Inc.; and an experience session on the "Maintaining of Gas Service under Flood Conditions" which was led by F. A. Hough, Southern Counties Gas Co. and E. H. McDermott, Southern California Gas Co. Last on the program, before the closing remarks of General Chairman Allyne, was a motion picture on the Installation of a Submarine Gas Main with comment by C. P. de Jonge of San Diego.

Meetings during the two-day session were broken by group luncheons. Featured speakers at these gatherings were A. B. Macbeth, president of the Southern California Gas Co. and N. R. McKee, president of the Pacific Coast Gas Association. Humorous relief from the rounds of technical discussion was offered at the first luncheon meeting by Gene Coughlin, sports editor, Los Angeles Evening News, and at the second luncheon meeting by Jack Hinds, M. G. M. property man. Deke Houlgate of the American Gas Association acted as master of ceremonies.

Next regional meetings of the Pacific Coast Gas Association will be the Northwest Conference to be held in Portland, Ore., on June 16 and 17.

■ ■

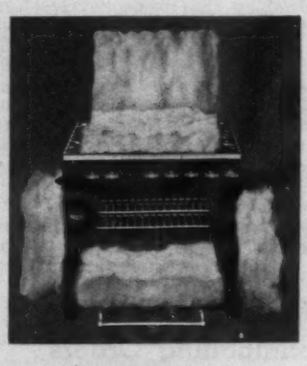
D. R. Edwards Promoted

David R. Edwards has recently been promoted to the position of manager of the Columbus department, Ohio Fuel Gas Co., which has charge of all property and equipment of the company in Ohio. Mr. Edwards was formerly service manager of the Columbus office.

WEDGEWOOD ★ THE CHEF'S CHOICE

A *Cool* KITCHEN

Heavy insulation holds the heat in Wedgewood ovens and broilers and keeps the kitchen and dining room cool . . . a feature appreciated by the guests as well as the chef. This Wedgewood feature alone saves enough on air conditioning bills to pay for the range!

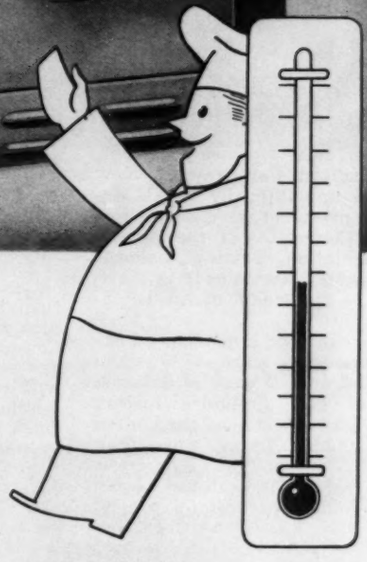


4½ Inches of Glass Wool Insulation

Keeps the oven door and outer walls cool enough to lay your hand on!

Lower Food Costs

No burned food caused by overheating ovens when the Wedgewood Oven Heat Control is on the job! Almost no meat shrinkage . . . more servings per roast.



26 DIFFERENT
RANGE-TOP COMBINATIONS

★

EFFICIENT ECONOMICAL OPERATION

★

20% MORE COOKING AREA

★

FLEXIBLE COOKING CAPACITY

★

UNIFORM HEAT DISTRIBUTION

★

RUGGED STREAMLINED STYLE

For use with Natural, Manufactured, or Bottled Gas.

WEDGEWOOD *Custom Built* HEAVY DUTY GAS RANGES

JAMES GRAHAM MANUFACTURING CO., LOS ANGELES, SAN FRANCISCO, NEWARK, CALIFORNIA; PORTLAND, OREGON

P.C.G.A. Signs for Western World's Fair Exhibit

THE Pacific Coast Gas Association has signed a contract for more than 6000 square feet of floor space for the $130,000 gas industry display in the Homes and Gardens Building of the 1939 Western World's Fair in San Francisco. Two-thirds of the exhibit cost have already been contributed by California gas companies. The Sprague Meter Co., through the voluntary $1000 donation of W. P. Hutchinson, company president, is the first manufacturing concern to contribute to the exhibit fund.

A committee, headed by R. E. Fisher, vice-president, Pacific Gas and Electric Co., and representing both the utility and appliance manufacturing branches of the gas industry, is now working out exhibit details. According to an announcement by Mr. Fisher, L. E. Lindsey, display manager, Seattle Gas Co. will supervise the design and construction of the industry exhibit.

Treasure Island, the Exposition site, will be serviced with gas through a submarine pipe line under San Francisco Bay and the gas exhibit will demonstrate every economy of this fuel, Clifford Johnstone, P.C.G.A. managing director, has announced.

■ ■

N. T. Sellman Is Chairman of Laboratories Committee

N. T. Sellman, assistant vice-president, Consolidated Edison Company of New York, has been appointed by N. C. McGowen, A.G.A. president, as chairman of the Managing Committee of the American Gas Association Testing Laboratories, to succeed the late John S. DeHart, of Newark, N. J., president of the Isbell-Porter Co.

Mr. Sellman has been a member of the Managing Committee since 1925 when the A.G.A. Laboratories were established as the official gas appliance testing agency for the gas industry of the United States and Canada. Today more than 93% of the 2,500,000 gas appliances produced and sold annually in the United States and Canada, are first tested and approved by the A.G.A. Laboratories, which certifies that they conform with national requirements for safety, durability and efficiency.

■ ■

Oklahoma Dealers Enter Appliance Sales Contest

The Oklahoma Natural Gas Co., Tulsa, is co-operating with distributors and dealers in gas ranges and refrigerators in two sales campaigns covering approximately 40 Oklahoma cities and towns served by the company.

The "Old Stove Round-Up," which started March 21, will continue to May 14. The aim of the campaign is to round up the 1938 quota of 3200 old ranges, breaking the 1937 record of 2549. The opening of the campaign was featured by a mile-long street parade in Oklahoma City held during the fat stock show.

In order to stimulate the sale of gas refrigerators, a "Dress-Up Contest" is being held from April 4-May 28. One of the features of this contest is the supplying to each company and dealer employee participating in the campaign an undraped figure which is to be clothed as rapidly as possible. Two pieces of clothing will be furnished for each two refrigerators sold to customers of the Oklahoma Natural Gas Co. The quota is 10 refrigerators per man for eight weeks of the contest.

■ ■

A.G.A. Domestic Range Committee Reorganized

The sub-committee for the promotion of the certified performance range has been merged with the Domestic Range Committee, according to an announcement by American Gas Association, and the membership of the committee revised to six men. Members are Frank Houston, Rochester, chairman; C. C. Young, Kansas City; A. F. Rice, Los Angeles; B. T. Franck, Grand Rapids; R. A. Maloney, Bridgeport; and J. L. Johnston, Providence.

The A.G.A.E.M. members of this joint committee are Watt Derwent, George D. Roper Corp.; E. R. Guyer, Cribben and Sexton Co.; John A. Fry, Detroit-Michigan Stove Co.; S. E. Little, American Stove Co.; Allan P. Tappan, Tappan Stove Co.; and T. T. Taylor, Roberts and Mander Stove Co. John West, Jr. and R. S. Agee are the A.G.A. and A.G.A. E.M. staff representatives.

The principal purpose of the joint Domestic Range Committee is to promote the Certified Performance gas range, which will be available August 1.

■ ■

A. F. Bridge Heads New P.C.G.A. Committee

A. B. Allyne, chairman of the Technical Section, Pacific Coast Gas Association, has appointed A. F. Bridge, vice-president of the Southern Counties Gas Co., to head a committee formed to study gas holder maintenance. The committee will work with California Railroad Commission engineers in the preparation of rules for gas holder maintenance to be sponsored and issued by the Commission.

Committee membership includes: H. L. Masser, executive vice-president Southern California Gas Co.; D. H. Perkins, general superintendent, San Diego Consolidated Gas and Electric Co.; R. S. Fuller, engineer of gas construction and operation, Pacific Gas and Electric Co.; A. R. Bailey, gas engineer of the Coast Counties Gas and Electric Co.

■ ■

Southern Natural Gas Pipe Line Purchase Approved

The Security and Exchange Commission, Washington, D. C., gave its approval in March to the acquisition by Southern Natural Gas Co. from the Mississippi Power and Light Co., Jackson, Miss., of three branch pipe lines, rights of way and appurtenances extending from the latter company's main line to Yazoo City, Kosciusko, Durant, and Goodman, Miss., for $97,378.

■ ■

Morgan Is Cuero Manager

Gene Morgan, formerly of Stephenville, Texas, is the new manager of the Cuero, Texas, office of the Southwest Gas Co., Lockhart, Texas.

Rio Grande Valley Gas Co. Purchases Hidalgo Lines

THE Rio Grande Valley Gas Co., Brownsville, Texas, completed purchase in March of the La Blanca-Weslaco and Samfordyce-San Juan pipe line systems of the Hidalgo County Gas Co. and company franchises issued by the City of McAllen or other subdivisions. The sum involved was $121,943.57.

According to the deed recorded in Edinburg, Texas, the grantors, who are Showers & Moncrief, Inc., Houston, Roy C. Myston, Rockport, and E. M. Cloust and T. F. Murchison, San Antonio, retain a vendor's lien and deed of trust against the pipe line system.

The La Blanca-Weslaco system consists of .52 mi. of four and one-half in. pipe, 12.97 mi. of five and one-half in. pipe, and 1.8 mi. of six and five-eighths in. pipe. The Samfordyce-San Juan pipe line system contains 35 mi. of four and one-half in. pipe as well as branch and lateral lines. Excepted from sale were all Hidalgo pipe, pipe lines, laterals, branch lines and connections within any city limits, as well as franchises as to sale, delivery of gas, and supplies or equipment not used in the two pipe line systems.

■ ■

Convention of Missouri Utilities Held In April

The 32nd annual convention of the Missouri Association of Public Utilities was held at the Hotel Jefferson, St. Louis, Mo., April 20-22. A Safety Meeting, held the afternoon of April 20, comprised the opening session. The first general session was held Thursday morning, April 21, with Chester C. Smith, association president, Kansas City Power and Light Co., presiding. Walter C. Beckjord, vice-president, American Gas Association, addressed the meeting on "Looking Forward in the Gas Industry." The final general session, Friday afternoon, April 22, was an open forum meeting with Fred Karr, Gas Service Corp., St. Joseph, Mo., presiding.

■ ■

Home Service Conference To Be Held June 7-10

Sponsored by the Home Service Committee of the American Gas Association, Mildred Clark, Oklahoma Natural Gas Co., chairman, the second annual Home Service Conference and Training Course will be held in Kansas City, Mo., June 7, 8, 9 and 10, at the Hotel Muehlebach.

Invitations to the four-day course are being extended to all home service directors as well as teachers and students from Colleges of Home Economics. The course will include actual demonstration and practical instruction in the use and care of gas equipment.

■ ■

Air-Conditioning Orders Show Gain in February

According to the Department of Commerce, Washington, D. C., the value of orders booked for air-conditioning equipment during February amounted to $3,677,370, against $2,655,874 in January and $4,786,037 in February, 1937.

Life SUSTAINING DROPS OF WATER . . . CAN *Wreck* YOUR CHIMNEY WALLS!

Growing things need these life-giving sparkling drops of water. But—this same glistening bead of dew (CONDENSATION) destroys chimneys, voids hard-won good will, and stills the wheels of thriving businesses!

Moisture (chimney sweat) is absorbed by brick and mortar. It freezes and E-X-P-A-N-D-S; causes chimney cracks—heat loss, ruined plaster and eventual chimney destruction.

Overcome the corrosive action of condensation. Use VITROLINER, the Permanent Chimney Liner, with HOWLE HEAT EXTRACTOR or CONDENSATION ELIMINATOR. Vitroliner is covered, both inside and out, with special high temperature acid resisting vitreous enamel. It checks the destruction of the Products of Combustion.

Howle Heat Extractor lowers fuel costs, increases basement temperatures 10°-20°, warms first floors. It traps harmful moisture.

Condensation Eliminator is used when space is limited. It increases basement temperatures 5°-7°.

Condensation Products are standard equipment for utility companies in the Chicago area and throughout the United States and Canada.

Condensation Eliminator Patented

Howle Heat Extractor Patented

BE INFORMED—Send for folder describing the outstanding improvements in scientific home heating efficiency.

Address all Canadian inquiries to 184 Horton Street, London, Ontario, Canada.

CONDENSATION ENGINEERING CORPORATION

TELEPHONE MONROE 1031

335 South Western Avenue, Chicago

Send for this FREE BOOK

92 PAGES OF CONSTRUCTIVE SALES TRAINING

Note These Chapter Headings:

- "Licking the Price Problem"
- "What People Buy"
- "Why People Buy"
- "The Buying Reason of Gain"
- "The Buying Reason of Safety"
- "The Buying Reason of Convenience"
- "The Buying Reason of Pride"
- "How People Buy"
- "The Three Decisions that Govern Buying"
- "A Simple Selling Process"
- "Methods of Proof"
- "How to Handle Objections"
- "Find That Missing Buying Decision"
- "Putting it up to the Prospect"
- "How to Close"—etc.

This 92-page book "How To Increase Your Sales" has been voted the most constructive piece of literature ever produced in this industry. That sounds like a flamboyant statement—but note we said "voted." It is the statement made by dealers and manufacturers—not us. Proof of that statement is found in the fact that appliance manufacturers are buying literally thousands of copies for their own private distribution. Send for a copy today. You will want every member of your sales force to read it. As the Foreword says: "This book is *not* about porcelain enamel. This book is about selling." Send for a copy now—before you forget.

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DURABILITY PORCELAIN ENAMEL Fused on Metal

PORCELAIN ENAMEL *THE Lifetime Finish*

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Send me a copy of your FREE book: "How to Increase Your Sales."

Name.....

Firm.....

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An Industry for a Salesman Looking Toward the Future

MANY gas appliance salesmen are often prompted to ask whether there is a promising future in the gas business. The question answers itself, when the statistical records of the gas business are examined. During 1937, the natural gas total production according to the American Gas Association reached "an all-time high of more than two and one-half trillion cu. ft. or more than 17 per cent above the previous peak established in 1936."

The manufactured gas industry showed total sales of 355,481,000 cu. ft. during 1937, which represents an increase over 1936. The real growth of the industry is shown, however, when we realize that in 1906, the production was about one-third this total. When a solid, well-established industry like the gas business can triple its sales in just over twenty years, it represents real progress, considering that the industry itself, is better than 100 years old.

The trend very definitely shows that gas, as the ultimate in fuels, is steadily gaining popular support, over its solid and liquid fuel rivals. The battle of the fuels is an intensive one. Bud Rutherford, vice-president of the Worcester Gas Light Co., Worcester, Mass., once said. "There's no fuel like an old fuel." Especially when it offers like gas, advantages that no other fuel can begin to equal.

The ability to see things in their proper perspective, over a long range, is invaluable these days. The national advertising campaign of the A.G.A., the massed efforts of the appliance manufacturers through the national prize sales contests sponsored by the A.G.A.E.M., the spirit of the industry itself to win the battle of the fuels, the universal acceptance of gas by the public as the logical fuel, wherever it is available, are signposts to a bright future that no gas appliance salesman can afford to ignore.

■ ■

Special Sales Drive Honors President of B. C. Company

Since 1935 the British Columbia Electric Power and Gas Co., Vancouver, B. C., has launched a special sales drive during the month of May in honor of the company president, W. G. Murrin. This year, since the annual campaign will mark Mr. Murrin's 25th year in the service of the company, the British Columbia Co. is launching a Silver Jubilee Drive with a new sales quota of $90,000 in order to make May the outstanding sales month in the history of the company. Valuable prizes will be awarded employees who cooperate in making the campaign a success.

SALES SLANTS

A month by month presentation of experiences on the sales front.

Send Up "Trial Balloons"

ONE reads* a lot these days about "trial balloons." Politicians send them up whenever they want to find which way the "wind is blowing"—the wind of public opinion.

But the "trial balloon" method is not so new. Good salesmen have been using it ever since salesmanship was "invented." The trial balloon method is based on the fact that the so-called "psychological moment" for closing a sale may occur at *any* time during a sales presentation. Once a prospect makes up her mind, she's ready to sign up. Any further delay—such as continued talking—often loses the sale.

Thus the experienced man "asks them to buy" and asks them often. He doesn't necessarily say, "How about signing, now, Mrs. Jones?" but he accomplishes the same thing by sending up trial balloons during the interview.

"Which model do you think you'd like in your kitchen, Mrs. Jones?"

"You'd prefer the table top model with automatic lighting, wouldn't you, because, etc."

"With this range you can start cooking the *modern* way tomorrow—think of the time and labor saving convenience. I know you'd appreciate that, wouldn't you?"

"Supposing you decide that you'd like this modern range, would Friday be a convenient day for us to install it for you?"

. . . Closing a sale is not a separate matter from the rest of your sales presentation, something to be tacked on at the very end. Your prospect may be "ripe" for the close at *any* time. Some particular point in your story may be *the* point that "sells" her. Right then is the time to try a close.

And the way to recognize the time is to send up trial balloons—often!

*Reprinted from a sales letter distributed by Philgas Department, Phillips-Petroleum Co. under date of February 18, 1938.

The Sale The Boss Lost

RECENTLY, a veteran salesman whose even disposition was well known among his friends and colleagues, was seen leaving a house, at which he had been calling. He was plenty mad.

"What's eating you?" asked a friend.

"Eating me? I wish the sharks would eat that boss of mine," he replied.

"What's the matter, is the manager on the rampage again?"

"I wish he was. Anything would be better than his going around telling everybody how rotten business is. Acts as though he gets quite a kick out of it. Maybe he thinks he's fixing himself a cast-iron alibi, but he sure makes it tougher than it ought to be for us salesmen.

"The people I just called on can afford, need and would buy a gas refrigerator if . . . . may his etc. etc. . . . . that gol-durned Jerimiah at the office had only spent less time scattering seeds of gloom and more time bidding his hands properly, when he played bridge with them last night.

"Every time I asked Mrs. S——— for the order, she'd a thousand reasons . . . . quoting my boss . . . . why she shouldn't, because blah-blah . . . ."

The point needs no elaborating. Much of today's buying fear can definitely be ascribed to the gloom-casting of higher-ups, who have never stopped to consider the boomerang consequences of their words.

Peoples Gas Light Co. Offers Second Cooking Carnival

THE second annual Cooking Carnival held this year, April 4 to 9, by The Peoples Gas Light & Coke Co., got caught in April showers, 17 in. of snow, plenty of sleet and high wind, but the audience—20,000 for the week—was of higher caliber than last year due to the fact that there were fewer strictly entertainment features which have the tendency to draw more people.

"Little Curly Top" Barbara Jenkins was the star of the show again this year and played to appreciative audiences. She appeared twice daily on the general program and also as guest star at several of the 10 gas range booths. The Progressive 10-Course Dinner, which carried the crowds from one range booth to another in viewing the preparation at each of a single course, was another chief attraction.

To emphasize the baking ability of the modern gas range, there was a series of demonstrations, one being, "That Professional Touch in Baking," and another, "Bread Basket," which presented breads from all nations. At another point on the program a Pyramid of Cakes was baked and prominently displayed at the Home Service booth. This booth also drew crowds with the demonstration, "Skill at the Skillet" and "Fish Favorites."

Star of the Cooking Carnival again this year was Child Cooking Expert Barbara Jenkins, who is shown above with her assistant, Alida Drake.

Carl Sorby, sales promotion manager George D. Roper Corp., presented a series of humorous demonstrations in the Home Service Auditorium. Another daily feature was conducted by a kindly gentleman. Dr. Query, who each day asked six attending ladies to discuss easy problems on cooking.

A Cook's Tour of the World presented foreign costumes and foods, featuring many dishes favored in other countries. A daily feature after the first day was "The Food Parade," which presented first a beautiful exhibition of all kinds of foods; second, "Masterpieces of Meat"; third, a display of desserts; and last, a "Procession of Lenten Foods."

The closing day program, which was built around Barbara Jenkins' drawing power with the youngsters, included a cookie show, entertainment, Barbara's last appearance for the week, and a contest for children's cakes. Thirty excited children received three $5.00 prizes, 10 $2.00 prizes, and 15 $1.00 prizes.

Ten gas ranges were given away as prizes in a contest which sought for the best answers to questions involving the modern automatic gas range and cool cooking cleanliness, fuel costs, fuel flexibility, the range's automatic features, broiler results, "waterless" cooking, "low temperature" oven cooking, etc. The contestants were also required to write 50 words or less on the subject "Why I Prefer Gas Cooking." A special evening during the Carnival was given over to employees of the company.

The range manufacturers entering the Parade of Gas Ranges were A. B. Stove Co., Crown Stove Co., Detroit-Michigan Stove Co., Estate Stove Co., American Stove Co., Norge Corp., George D. Roper Corp., Tappan Stove Co., Cribben & Sexton Co.

■ ■

"Gas—The Modern Fuel" Is Theme of Industry Float

In the Motorcade of approximately 300 floats, held in New York City, April 30, as a preview to the 1939 New York World's Fair, the gas industry was represented by a streamlined float depicting the theme, "Gas—the Modern Fuel." The float, which was managed by Gas Exhibits, Inc., was symbolic of the more than a century of continuous service rendered by the gas industry.

Grouped at the head of the 35-foot mobile panorama were four living models holding up a flaming torch on which rested a large globe surrounded by stars and planets, representing the vestal virgins of mythology who kept the universe's fires perpetually going. An arch-shaped sign identifying the float by the words "Gas Industries" bridged the latter group with a large model of the "Court of Flame" occupying the rear of the float and towering more than 13 feet above the street. Encircling the float, an effect of waves of flames in brilliant colors was produced to give an atmosphere of action to the presentation.

■ ■

A.G.A. Holds Commercial Sales Conference In May

The A.G.A. Hotel, Restaurant and Commercial Sales Conference, sponsored jointly by the Industrial Gas Section, American Gas Association, and the Metropolitan Industrial Gas Sales Council, will be held May 23-24, in the Commodore Hotel, adjoining Grand Central Terminal, New York City. Hale A. Clark, Detroit City Gas Co., is chairman of the Industrial Gas Section and Alva L. Palmer, Brooklyn Union Gas Co., heads the Metropolitan Industrial Gas Sales Council.

Industrial gas men, gas company executives, as well as hotel and restaurant men from all parts of this country and Canada will gather for the two-day program, which has been arranged by Joseph F. Quinn, Brooklyn Union Gas Co.

The program, which will be divided into four sessions, will include papers dealing with the following subjects: "Getting 100 Cents of the Commercial Cooking Dollar," "Selling Complete Gas Service to Commercial Customers," "What's New in Commercial Gas Appliances," and "How a Customer Evaluates Commercial Gas Service." Presiding chairmen at the respective sessions will be Mr. Clark, Frank H. Trembly, Jr., Philadelphia Gas Works Co., and vice-chairman, Industrial Gas Section, and Joseph Quinn.

■ ■

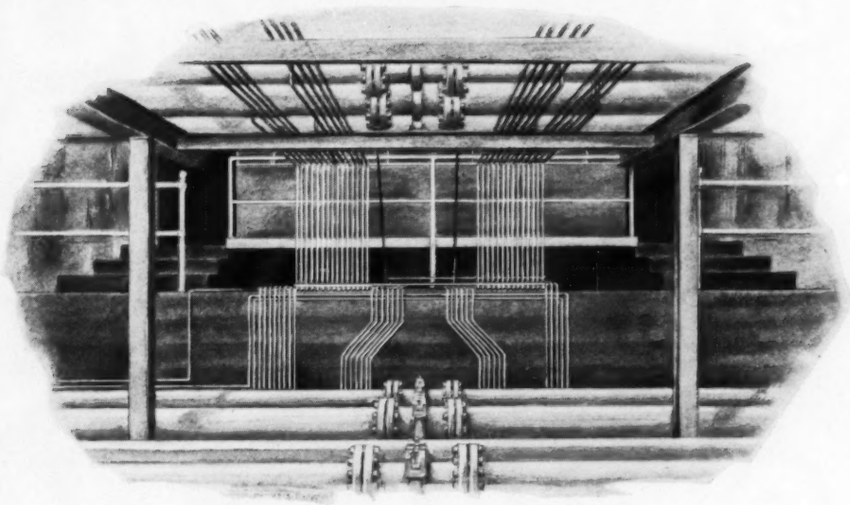
"Happiness Parade" Opened By Mississippi Utility

The 1938 Happiness Parade, placing in review the modern gas and electric services offered by the Mississippi Power and Light Co., Jackson, Miss., opened April 1 to continue through May and June. The Parade is being carried on by the utility company in cooperation with appliance dealers throughout Mississippi. The current drive is centering attention on home modernization through the additional stimulus of the 1938 Happiness Home Review and Cooking School. At the close of the three-months campaign, a Happiness Parade Party will be given in the division which goes over the fixed sales quota by the greatest majority.

■ ■

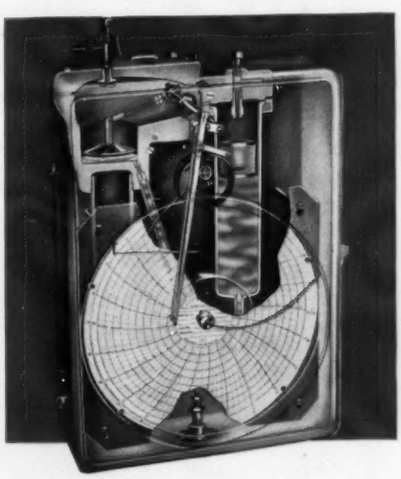
Hayler Has New Appointment With Central Indiana

Rodney G. Hayler has been appointed head of the new general commercial department, replacing what was previously the sales department, of Central Indiana Gas Co., Muncie, Ind. Assisting Mr. Hayler at his new post will be Frank Caton, assistant commercial manager, and L. E. Bracken, advertising manager.



SIMPLICITY

in measurement engineering



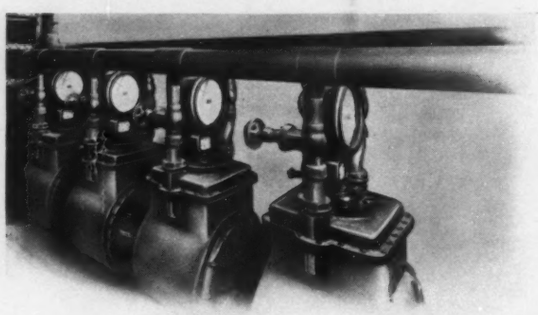
SUSTAINED ACCURACY

in measurement and control

ACCURACY equal to the smallest visible reading on test gage or chart . . . or exact measurement of gas flow to pilot light! **METRIC-AMERICAN** and **WESTCOTT-AMERICAN** Orifice and Positive Displacement Meters literally test to laboratory standards of accuracy.

But what really counts is maintained accuracy *out in the field . . .*

There is no greater factor, in achieving this unfailing sensitivity, than the *simplicity* which painstakingly has been engineered into design and construction. With fewest possible parts . . . fewest moving parts. The result of American Meter Company's continuous research; its experience with hundreds of thousands of meters installed!



Simplicity and ruggedness mean less repair . . . easier inspection, test and adjustment . . . easier cleaning. And low-cost maintenance!

In the orifice meters, by quickly removing the low-pressure chamber cover of the differential gage body, the entire interior is accessible — without loosing a single connection affecting accuracy. Adjustments interfere with none of the working parts. You use only ordinary tools.

In the displacement meters . . . testing, proving and adjusting are made with the same relative facility.

AMERICAN meters are **PRACTICAL** instruments. American Meter Company's resources insure proper investigation, selection and quality of materials . . . large-scale meter manufacture permits economy prices on quality products.

NOW READY! . . . THE

Metric Remote Recorder

Air-Actuated

The new METRIC Air-Actuated Remote Recorder accurately charts — at a point remote from meter installation — the volume of gas, air, steam or fluid measured by orifice method. The same principle may be utilized in zero to 100% throttling in the control of rate-volume, or for automatic reset control. • Action is positive, the instrument rugged, and highest standard of accuracy is maintained even under abnormal operating conditions.

1051-38

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AMERICAN METER CO. INC.

ESTABLISHED 1836

Indiana Gas Association Convenes May 15-17

THE Indiana Gas Association will hold its 28th Annual convention May 15-17, at the Hotel Gary, Gary, Ind. H. Carl Wolf, Central Indiana Gas Co., Muncie, Ind., association president, will speak at the opening session on "Indiana's Position in the Gas Business."

On the afternoon of May 16, the Technical Section will hold a special session with Herman Horstman, Public Service Company of Indiana, Indianapolis, presiding. Speakers included in the Technical Section program will be Phillip Rector, Central Indiana Gas Co., Muncie, reporting for the Unaccounted-for-Gas Committee; J. M. Pickford, Northern Indiana Public Service Co., Hammond, Appliance Servicing Committee Report; L. A. Kirch, Public Service Company of Indiana, who will present the A. G. A. Management Committee report.

The program for the second morning session will open with Prof. R. E. Greenlea, Purdue University, speaking on "Employee Education." Carl Sorby, George D. Roper Corp., will talk on "The Certified Performance Gas Range;" "Gas Load Building with Water Heating" will be presented by Fred C. Armbruster, Middle West Service Co., Chicago. Closing the second morning session, employees of the Gary Heat, Light and Water Co., will offer a skit, entitled "Gold in the Gas Range." Opening the second afternoon session, Dr. J. L. Bray will present a paper on "Gas Engineering Activities at Purdue University."

■ ■

"Hoist Your Sales" Contest Launched In New York

The Brooklyn Union Gas Co., N. Y., has launched its new "Hoist Your Sales" contest, to extend from March 11 to July 9. Open to all approved appliance dealers in the eight company districts in the Brooklyn and Queens area, N. Y., the contest provides opportunity for every dealer to win one or more prizes. For every retail, domestic, or commercial sale made during the contest period, points will be awarded to dealers, provided appliances sold are delivered by July 30. At the conclusion of the contest each dealer with ten or more points may select the prizes he wishes on the basis of his total point accumulation. Prizes offered include golf sets, radios, rings, watches, traveling bags, and various other popular gifts.

■ ■

"Gas Rangers" of Houston Hold Sales Campaign

Texas appliance dealers through the co-operation of the Houston Gas and Fuel Co., are staging a new gas range sales campaign which was officially opened April 5, at a barbecue meeting when W. A. Hudson, Houston Gas and Fuel sales manager, presented campaign plans to the Gas Rangers.

The campaign slogan, "Dress Up Your Kitchen—The Gas Rangers Are Coming," is an adaptation of the American Gas Association's spring range campaign title "Dress Up Your Kitchen." The Gas Ranger idea is designed to capitalize on the respect every native Texan has for his Rangers.

Interior view of the lower floor of the newly constructed New Mexico Gas Co. building in Santa Fe, N. M.

New Mexico Gas Co. Moves Into New $50,000 Home

ON completion of the new $50,000 home of the New Mexico Gas Co., Santa Fe, N. M., the company held formal open house, March 12, to welcome local residents to the new headquarters.

The new building combines three centuries of architectural tradition in its "Santa Fe Style" of Pueblo architecture. Special attention has been given to the sales rooms and their unique decoration. In one corner of the display room is an Indian fireplace, while hand-wrought tin lighting fixtures, hand-made furniture and hand-carved counters add to the typically native atmosphere. Colorful paintings decorate the walls, and hand-made doors in natural finish form a neutral background for the colorful accouterments.

The lower floor of the building accommodates, besides the salesrooms and cashier's office, the managerial and sales offices. Executive offices are on the second floor.

Building grounds are extensive and plans are now under way to erect tennis courts adjacent to the building for the use of employees.

Coincident with the erection of the New Mexico Gas Co. building have come two reorganization plans for the Southern Union Gas Co. of Dallas, Texas, of which the New Mexico Co. is a subsidiary. The Southern Union Gas Co., Texas M and M Pipe Line Co., Wink Gas Co., Cities Water Co., Texas, and Kingfisher County Gas Co. on January 1, became known as the Southern Union Utilities Co. On March 1, in New Mexico the Pecos Valley Gas Co., the Gas Company of New Mexico, Consumers Natural Gas Co., and Lovington Gas, Water & Sewer Co. were consolidated into the New Mexico Eastern Gas Co. Recently elected executive vice-president of Southern Union Gas Co. and all subsidiary companies was Albert Sidney Johnson, who is planning to tour company properties in the near future.

■ ■

S. E. Ledbetter Wins Servel Sales Award in Los Angeles

With the grand total of 662 gas refrigerator sales to his credit, S. E. Ledbetter, of Santa Monica, was recently presented with a Servel Star Salesman gold button with one diamond by N. R. McKee, vice-president in charge of sales for Southern Counties Gas Co. The presentation was made at the twenty-seventh annual sales dinner of the Southern Counties Gas Co. in Los Angeles.

■ ■

Successful Range Campaign Concluded by Gas Service

The business department of the Gas Service Co., Kansas City, Mo., on March 26 closed its 30-day range campaign which resulted in the sale of 915 ranges which were installed during the campaign period. Sales exceeded by 15 ranges the quota of 900 that had been set prior to the start of the drive.

Good showings were made in the following company districts: Kansas City had a total of 154 ranges for the period; Wichita, 145; and Wyandotte, 98.

Gas Unit Heaters Prevent Steel Rusting in Storage

IN Portland, Ore., Seattle and the Port of Vancouver, Wash., gas unit heaters are used to prevent the rusting of steel in storage. On the Vancouver docks two storage rooms used for warehousing canned goods en route to foreign countries are equipped with gas unit heaters suspended from the ceiling at several points. Heated air, blown throughout the rooms from these heaters prevents rust spots from forming on the cans. Gas unit heaters have also been installed by a steel company in its Portland and Seattle warehouses to protect the steel stock from rust. These heaters take the place of a central heating plant and are entirely automatic in operation. The Seattle Gas Co. and the Portland Gas and Coke Co. cooperated in the installation of these heaters.

In New York City a dealer in tool steel (bar and block) stores more than 5 carloads in an unheated warehouse. During working hours the doors are open and in cold weather the steel becomes cold. If the weather turns warm, the warm air carries more moisture than the colder air in the warehouse, and the cold steel acts like a condenser. The Consolidated Edison Co. of New York, Inc., installed two gas unit heaters and now the gas unit heaters are turned on when the weather is warm. By keeping the doors shut for a few hours, the room becomes warm enough to keep steel dry.

■ ■

Gas Service Cooking School Held In March and April

Under the direction of Betty Boyle, the Gas Service Co., Kansas City, Mo., has been conducting a series of cooking schools throughout Missouri. During March, Miss Boyle conducted the school sessions in Higginsville, Fort Scott, and St. Joseph. The Fort Scott school drew more than 800 women to the final session, held March 24. Prizes were given away each day of the three-day stay and a gas range was offered on the final school day.

On April 6, 7 and 8, Miss Boyle conducted a combination Gas Service Company and Chamber of Commerce cooking school in Cherryvale, Kan. Following the Cherryvale appearance, Miss Boyle conducted schools jointly sponsored by the company and the local newspaper in the following communities: Monett, Pierce City, Neosho, and Aurora, Mo. Miss Boyle was assisted on her school tour by Betty Jane Reeves, Jane Marshall, and Ellen Potter.

■ ■

British Premier's Official Residence Heated With Gas

No. 10 Downing Street, London, the historic residence of Great Britain's prime ministers was recently completely equipped with a gas-fired central heating and hot water system.

Three five-section boilers with a total capacity of 1,875,000 B.t.u. per hour with time clock and outside thermostatic control will carry the heating load, and two six-section boilers with a total capacity of 198,000 B.t.u. per hour, connected to two 150-gal. storage tanks, insulated and cross-connected for permitting either or both to be in use, will supply all the hot water demands of the prime minister and the members of his household.

With this installation, the "gasification" of No. 10 Downing Street is about completed. In the all-gas kitchen there have been installed two domestic gas ranges, a double-oven heavy duty range, a large gas hot-plate and a pastry oven.

Since the recent renovation of York House, St. James Palace, the Duke and Duchess of Gloucester have also been served by gas appliances.

■ ■

Seiple Elected President Of New Jersey Gas Men

Bernard A. Seiple, vice-president, Jersey Central Power and Light Co., Asbury Park, N. J., was elected president at the 27th Annual Convention of the New Jersey Gas Association, held April 12, at Asbury Park, N. J. Other officers elected were: first vice-president, George B. Webber, Public Service Electric and Gas Co., Newark; second vice-president, Frank H. Darlington, Peoples Gas Co., Glassboro; and secretary-treasurer, Harry A. Sutton, Public Service Electric and Gas Co., Newark.

The principal address was a paper by Walter C. Beckjord, read in his absence by Irving K. Peck, president of the Binghamton Gas Works. Mr. Beckjord reviewed trends in the gas business and suggested methods to meet competition in the fuel field. Alexander Forward extended the greetings of the A.G.A. Separate meetings of the Technical and Commercial Sections were held in the afternoon. Approximately 800 persons attended the convention at the Berkely Carteret Hotel.

■ ■

A.G.A. Tie-In Advertising Offers New Photo Series

With more than 700 gas companies sponsoring the A.G.A. tie-in advertising campaign featuring the slogan, "Gas is your quick, clean, economical servant," the demand for photographs offered in the two previous services has necessitated the preparation of the A.G.A. Photo Service Series, No. 3. The new series of 8 by 10 photos can be obtained from the A.G.A. Committee to Conduct National Advertising.

A recent report from the advertising committee discloses that 46,268,000 slogan messages have been carried by the combined totals of the advertising of the American Stove Co., and Glenwood Range Co. Added to 100,000,000 appearances of the slogan in the industry's national advertising program, the grand total is 146,268,100 appearances of the message.

■ ■

Lyle Jones Is Appointed Merchandise Assistant

Lyle B. Jones was recently appointed assistant superintendent of merchandising for the San Diego Consolidated Gas and Electric Co., San Diego, Calif. Mr. Jones' new position was formerly held by Paul Corriere. Since 1926 Mr. Jones has been engaged in gas and electric appliance selling. His former position on the Escondido, Calif., sales staff of the company has been filled by Fred Bulmer of the San Diego sales force.

Monroe Award to Be Made at October A. G. A. Convention

HE annual presentation of the Charles A. Munroe Award by the American Gas Association to the individual judged to have made the most outstanding contribution toward gas industry advancement, will take place at the annual A.G.A. convention in Atlantic City, N. J., next October.

The award, which consists of a substantial sum of money and a permanent certificate, may be presented for accomplishment in any line of the gas industry, such as refrigeration, labor saving accounting, rate making, dealer cooperation, sales expansion, research, etc.

Addison B. Day, chairman of the board, Southern California Gas Co., is chairman of the 1938 committee for judging applications submitted.

Companies employing individuals who are deemed worthy of consideration for the award are urged to sponsor applications in their behalf. All applications for the 1938 award should be filed with the American Gas Association, 420 Lexington Ave., New York City, before August 1, 1938.

■ ■

K. S. Wallace Represents AGP on Pacific Coast

W. T. Rasch, president, American Gas Products Corp., New York, N. Y., recently announced the appointment of Ken S. Wallace as California, Oregon, and Washington representative for the company. Mr. Wallace will have his headquarters in Los Angeles.

K. S. WALLACE

Previous to his association with American Gas Products, manufacturers of gas fired air conditioners, boilers, and floor furnaces, Mr. Wallace was in charge of house heating sales and engineering for Peoples Gas Light and Coke Co., Chicago. Mr. Wallace first entered the gas industry in 1925 as industrial service engineer for Southern California Gas Co.

■ ■

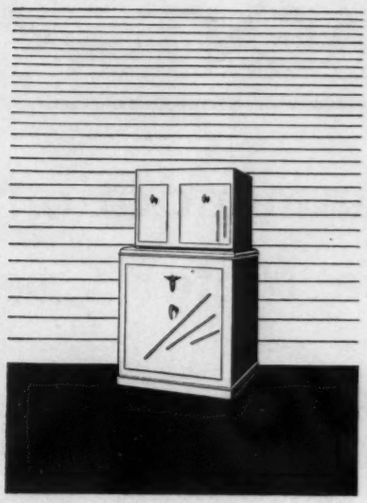
Community Natural Has New Offices in Gatesville

Community Natural Gas Co., Dallas, Texas, opened its new Gatesville, Texas, quarters for business April 1, Earl Heath, district manager for the company, announced recently. The new company quarters are now located in a new building offering a well-lighted display space for gas appliances. The 22 ft. by 88 ft. space occupied by the company also affords office and storage facilities.

■ ■

Mary Luther Directs Home Service For Indiana Co.

Mary Luther has recently been appointed in charge of the Home Service Department of the Central Indiana Gas Co., Marion, Ind. Miss Luther was formerly connected with the Home Service Departments of the Central Illinois Electric and Gas Co., Rockford and Lincoln, Ill.



GREETINGS

FROM

"Gas Headquarters"

The Surface Combustion Corporation, makers of JANITROL Heating Equipment, extends you its cordial invitation to stop in at THE ROOSEVELT and renew old friendships, make new ones, and in case you are in a hurry, just to say "Hello".

SURFACE COMBUSTION CORPORATION, TOLEDO, OHIO

"Gas Headquarters", where for over thirty years Gas burning equipment has been manufactured exclusively.

Certain Recommendations on the Use of Orifice Meter Coeffecients

By J. B. TAYLOR Gas Engineer, Signal Oil and Gas Company*

ON MAY 6, 1935, the Gas Measurement Committee of the American Gas Association completed Report No. 2, the subject of which was, "Recommendations covering use of certain types of orifice meters in measurement of natural gas." In the introduction of this report, are found the duties of this committee outlined in part as follows:

J. B. TAYLOR

"1. The determination of the correct methods of installing orifice meters for measuring natural gas.

2. The determination of the necessary corrective factors and operative requirements in the use of orifice meters, using natural gas in all experimental work."

Following the above report, and based on the tables in the report, Bulletin TS-353, titled, "Tentative Standard Procedure for the Measurement of Natural Gas with Orifice Meters," was completed on November 11, 1935. This was a report of a joint committee of the California Natural Gasoline Association, the Pacific Coast Gas Association, and the Southern California Meter Association. This latter report, as stated in the preface, "was organized to promote the adoption of the new coefficients on the Pacific Coast, and to devise a standard procedure for the use of the new data which would be suited to the needs of the Pacific Coast natural gas industry." The main differences being to standardize the base pressure of 14.73 lbs. and to revise the C.N.G.A. Bulletin TS-282. As a result of publication of these reports, many companies changed to the use of the coefficient data that had been so revised.

Particularly significant were the variations found in the use of the factors, notably the expansion factor, Fe, and the Reynolds number factor, Fr. It was found in a survey of the various companies that the use of these factors varied from a condition where the factors were not used, although the basic coefficients were in use, to numerous variations of changes of gas volume, differential changes, and corrections to gas volume totals. It was plainly evident that there was no standardized procedure for the use of the data and further that such lack of standardization hindered any possibility of uniformity of gas measurement, whether between companies or not, as well as to retard the universal use of the coefficients by all companies.

The Standards Committee of the Southern California Meter Association has, during the past year, studied this problem with the view of recommending a suitable procedure for the use of this coefficient data, a procedure that would be simple in application and outline, that would maintain a suitable degree of accuracy consistent with the other factors involved in the orifice meter measurement. This outline has been developed as a minimum requirement for good measurement and not intended to deter any organization from carrying the outline to greater detail.

Referring to the American Gas Association, Report No. 2, under Section IV, "Instructions for computing the flow of gas through orifice meters," it is noted that:

"1. Paragraph D—Fr Factor—The value of the extension, $\sqrt{h\,P_f}$ used in selecting the Fr factor may be based upon the meter record or estimated from a knowledge of the average static pressure and the average differential at which the meter may operate. An extension value selected as suggested will probably be sufficiently close to the average operating conditions of the meter for selecting the proper value of Fr, especially since

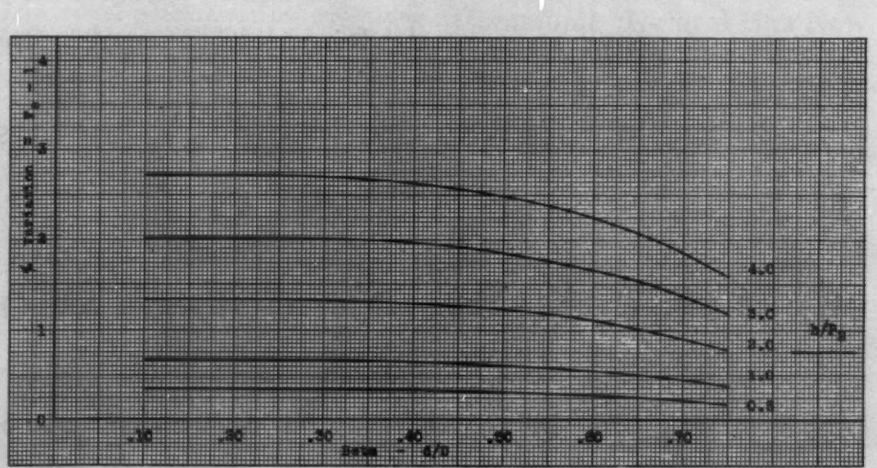


FIG. 1. Per cent variation due to expansion factor, Fe. Flange connections, pressure downstream. (C.N.G.A. values).

* A paper, "Recommended Use of Orifice Meter Coefficients (based on A. G. A. Report No. 2 and C. N. G. A. Bulletin TS-353)," presented before the Southern California Meter Association, Huntington Park, Calif., March 24, 1938.

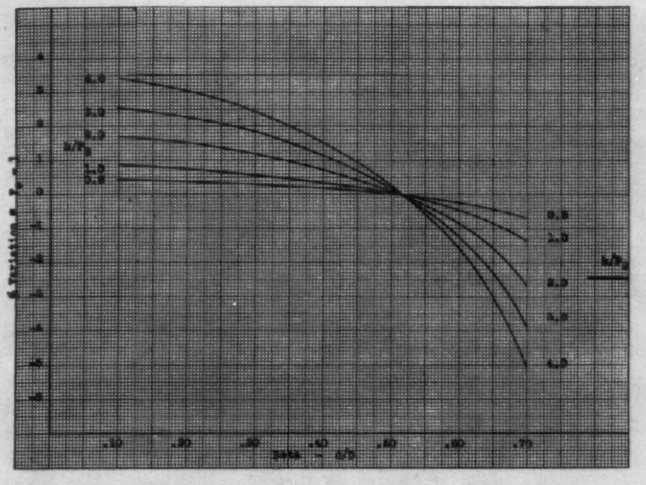


FIG. 2. Per cent variation due to expansion factor, Fe. Pipe connections, pressure downstream. (C.N.G.A. values).

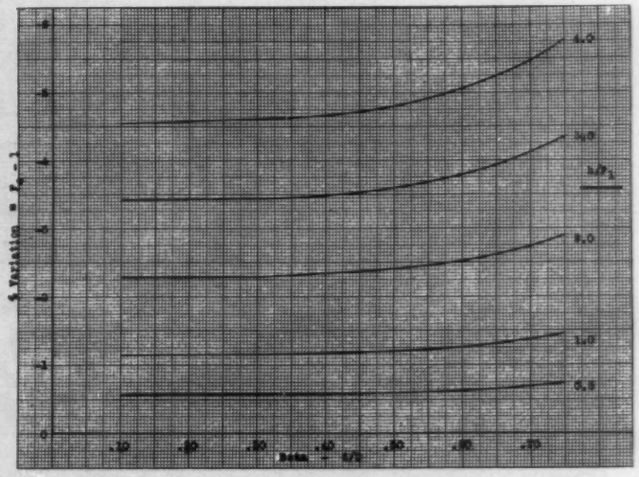


FIG. 3. Per cent variation due to expansion factor, Fe. Flange connections, pressure upstream. (A.G.A. values).

the variations in Fr corresponding to values of the extension, $\sqrt{h\ P}$, above or below the selected average will be compensating (plus or minus) over any appreciable length of time.

"2. Paragraph E—Fe Factor—The expansion factor, Fe, is taken from the tables, depending upon the tap location from which the static pressure is taken. Here the ratio, h/P is an index with which the value of Fe is selected and may be based upon the meter record, or estimated from the average static pressure and the average differential at which the meter may operate. The effects of operating variations from this 'average' h/P will ordinarily be compensating."

Referring to the Bulletin TS-353, "Standard Procedure for Computing Coefficients and Charts," it is noted "that in the determination of (Fe), the frequency with which new average (h/P) values should be determined and new (Fe) factors selected depends upon the conditions existing at the meter. These questions will have to be decided and agreed upon in each case by the parties involved." Standardization of the use of the coefficient data has been left to the individual parties.

Studying the data given, the factors necessary to compute gas volumes, it might easily be determined that the above quoted statements would be adquate for uniform use of the coefficients if all gas were measured under such pressures of 25 lbs. gage or higher. Where gas is measured under such pressures, the h/P ratio may be maintained within a reasonably close range and the extension, $\sqrt{h\ P}$, would be such as to render the Fr factor relatively unimportant. There are, however, large quantities of gas measured under lower pressures and high vacuums, where the h/P ratio may vary over a large range, the resulting effect being to reduce the accuracy of measurement unless the above mentioned factors, Fe and Fr, are changed to meet average flowing conditions. Here is the need for standardization.

The rules for the use of the coefficient data were: (1) to be simple and easily applied, (2) to require a minimum of work, (3) to be applicable to the entire range of orifice meter measurement from minimum flows to maximum volumes, and yet maintain accuracy. As mentioned before, the following rules are not intended to deter anyone or any organization from carrying the work to any greater detail.

Recommended Use of Coefficient Data from A.G.A. Gas Measurement Committee Report No. 2 and California Natural Gasoline Association Bulletin TS-353 is as follows:

1. Include all corrective factors to basic coefficient (Fe, Fr, T, G, and Fpv) in determining gas volume from orifice meter measurement. These may be applied to gas coefficient or volume as desired.

Fe, expansion factor
Fr, Reynolds number factor
T, temperature correction factor
G, gravity correction factor
Fpv, supercompressibility factor.

2. Estimate average differential, h, in inches of water and average static pressure, P, in lbs. per sq. ft. absolute for determining factors for Fe, Fr, and Fpv from average flow conditions. Note: Readings from a normal average chart are adequate.

3. Change factors with each plate change for the new flow conditions.

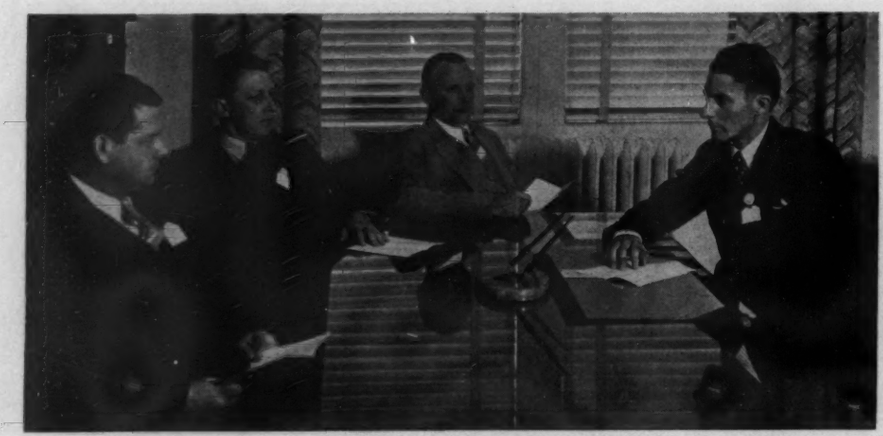
4. Change Fe and Fr factors when ratio of h/P (as determined by No. 2 above) for previous period for which T and G were used, has changed an amount greater than 1.0 i.e. h/P ratio at time of changing T and G has changed from 1.8 (previous factor) to 3.2 (present average) an increase of 1.4, and since this is greater than 1.0, factors should be changed to meet new conditions.

For volumes above 10 lbs. gage pressure, with h/P ratios less than 1.0, factors should be changed when h/P ratio is doubled or reduced by half.

Note: By observation, Fr becomes small and of little value as the extension ($\sqrt{h\ P}$) becomes greater than 10.0. Therefore, Fr may be changed only at such times as Fe is changed.

From the above listed recommendations, Nos. 1, 2 and 3 are self-explanatory and require no further simplification. Recommendation No. 4 outlines under what conditions the factors need to be changed for ordinary conditions of good measurement. It states that the Fe and Fr factors are to be changed when the average flow conditions have changed, so that the h/P ratio has increased or decreased by an amount greater than 1.0. The time considered for this average change to take place is the period for which the temperature and gravity factors were used. In other words, when a new temperature and gravity have been obtained and are to be applied to the coefficient, the Fe and Fr factors are changed if the flow conditions have so changed that the average normal chart indicates a ratio of h/P that differs from the factor in use by greater than 1.0. Incidentally, the factor 1.0 means that the differential may vary an amount

(Continued on Page 80)



Four of the leaders of the 14th Annual Southwestern Gas Measurement Short Course held at Norman, Okla., April 19-21, 1938 were (left to right) Publications Committee Chairman G. W. McCullough, Phillips Petroleum Co., Bartlesville; Retiring General Committee Chairman Gilbert Estill, Oklahoma Natural Gas Co., Tulsa; Banquet, Entertainment, and Local Arrangements Committee Chairman W. H. Carson, University of Oklahoma; Incoming General Committee Chairman L. G. Rheinberger, Sinclair Prairie Oil Co., Tulsa.

Over 550 Attend Sessions of Measurement Course

By O. D. HALL Staff Correspondent

TWENTY-SEVEN states, the District of Columbia and Old Mexico, were represented by registrants at the Fourteenth Annual Southwestern Gas Measurement Short Course, at Norman, Okla., April 19, 20 and 21. Breaking all previous records, registration exceeded 550.

The short course is sponsored by the College of Engineering, University of Oklahoma, assisted by corporation commissions of Oklahoma and Kansas, the Railroad Commission of Texas, Oklahoma Utilities Association, Natural Gas Department, American Gas Association and Natural Gasoline Association of America.

Among subjects presented in the general session were: "Natural Gasoline Association and The Gas Measurement Short Course," by W. F. Lowe, Secretary, N.G.A.A.; "Progress Through Association," by E. H. Poe, secretary, Natural Gas Division, A.G.A.; "Fundamental Principles of Orifice Meters," by A. D. McLean, Pittsburgh Equitable Meter Co.; "Fundamental Principles of Displacement Meters," by A. F. Benson, American Meter Co.; "Fundamental Principles of Regulators," by K. R. D. Wolfe, Fisher Governor Co.; "Chemical Analysis of Gases," by R. L. Huntington, Faculty, University of Oklahoma, and "Major Gas Fields and Reserves of Kansas," by J. H. Page, Kansas Corporation Commission.

Mr. Page said that about 50 of the 105 counties of Kansas are producing natural gas with total output of about 70 billion cu. ft. annually. Kansas, standing seventh in gas production, is exporting more gas than it imports, and has gas reserves estimated to last for 142 years, the speaker said.

Afternoon meetings were devoted to lecture and demonstration periods of gas, oil and equipment company experts, and college and university faculty members. Among subjects included in these studies were domestic and orifice meters, large capacity displacement meters, orifice and displacement meter charts, integrators, calorimeters, many types of regulators, valves, remote measurement and control instruments. Meter shop practice also was demonstrated.

Nearly 20 gas equipment manufacturers displayed modern types of gas measurement, pressure control and recording instruments in seven exhibit rooms on three floors of the University of Oklahoma Engineering building where the short course was held. Gas meters ranging from a few inches high, to one four ft. by 3 ft., weighing about 300 lbs., and with measurement capacity of 10,000 cu. ft. per hour, were on exhibition.

On the final day L. G. Rheinberger, Tulsa, superintendent of contracting and measurement, Sinclair Prairie Oil Co., was elected chairman of the general committee for the 1939 meter short course, succeeding Gilbert Estill, superintendent gas measurement department, Oklahoma Natural Gas Co., Tulsa, Okla. Other committee changes will await the November 1938 meeting when chairmen for the 1939 short course will be named and committee vacancies will be filled. Kate A. Niblack, chairman of the registration committee and acting secretary of the Oklahoma Utilities Association, is the only woman member of the general short course committee.

J. W. Howard, of the Kansas Power and Light Co., was awarded the $15 first prize for the best paper on the subject: "What I Learned at the Gas Measurement Short Course Last Year."

A banquet attended by more than 500 representatives took place Wednesday evening in the Students' Union Ball Room at the University. Dean W. H. Carson, of the College of Engineering, University of Oklahoma, was toastmaster.

■ ■

Trends in Regulator Design Discussed by S.C.M.A.

THE April meeting of the Southern California Meter Association was held on the last Thursday of the month at the Van Matre Inn, Huntington Park, Calif., with J. B. Taylor, president of the Association officiating. Feature address of the evening was presented by J. J. Delaney, general sales manager, Reliance Regulator Corp., Alhambra, Calif. Mr. Delaney's topic was "The Modern Trend in Regulator Design," and dealt with the latest developments in the manufacture of pressure reducing, back pressure, and boiler-fuel regulators, each design being illustrated by slides.

J. J. DELANEY

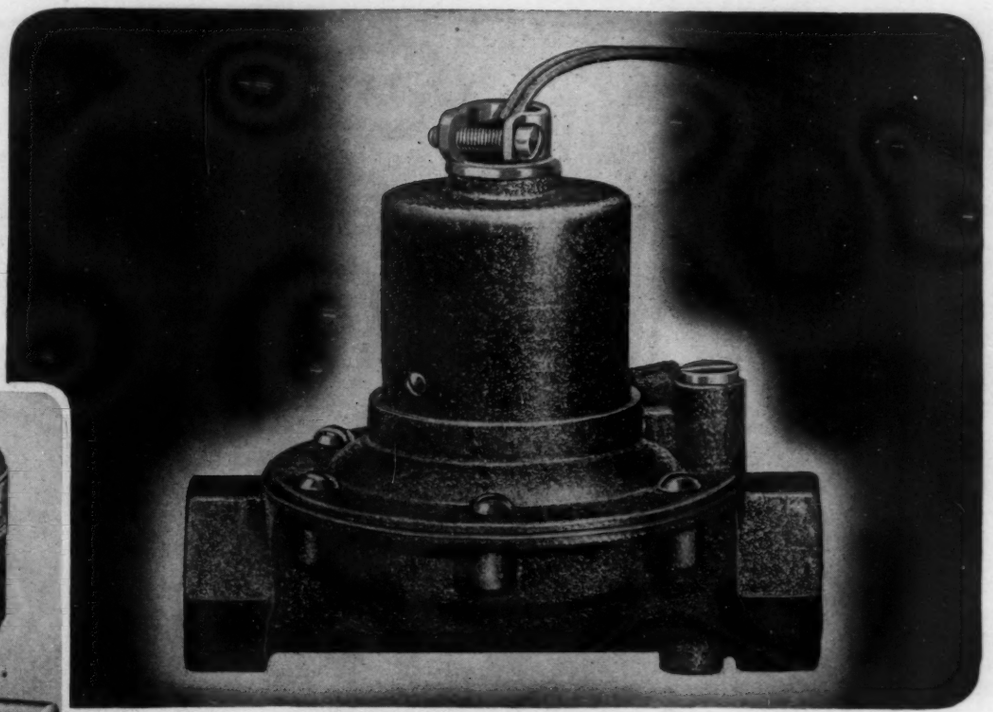
Of exceptional interest was the moving picture "Southern California Flood Pictures," which was taken by the Southern California and Southern Counties Gas companies during the peak point of Southern California's recent flood. The pictures are a valuable permanent record of conditions in the stricken area.

Entertainment was furnished through the courtesy of Reliance Regulator Corp.

■ ■

$40,000 Gas Treating Plant Planned by Producers' Co.

Producers' Gas Co., Hays, Kansas, is planning construction for the immediate future of a $40,000 gas treating plant, to be located approximately two miles south of Otis, Kansas. The company serves fuel principally to oil fields and border line cities. The company now has about 16 wells under contract.



Right, Klixon electrically-operated ¾" diaphragm gas valve.

Below, Klixon electrically-operated ½" direct-acting gas valve.

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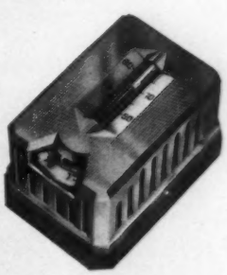

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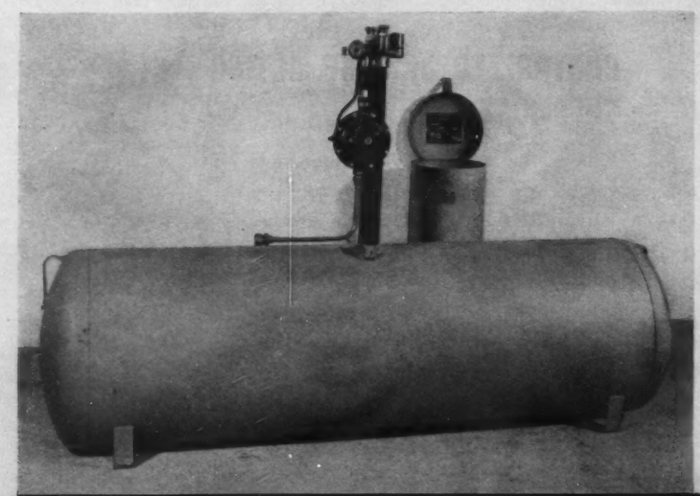

■ RegO COMPACT UNITS and SYSTEMS are designed to meet the requirements of National Fire Protection Association Pamphlet 58 and to comply with local, state and national rules and regulations. Unit assemblies and complete systems covered by United States letters patent and/or applications.

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BUTANE-PROPANE NEWS

An Appraisal of the Liquefied Petroleum Gas Industry--Its Past and its Future

● **R. W. THOMAS, Philgas Department, Phillips Petroleum Co., Bartlesville, Okla., in an address, "As to the Future of the Liquefied Petroleum Gas Industry," presented before the 25th Annual Meeting of the Compressed Gas Manufacturers Association, Waldorf Astoria Hotel, New York City, Tuesday, January 18, 1938.—(Abstract by G A S).**

MOST of us do a considerable amount of speculating about the future and we are all interested in each other's opinions as to what the future may bring for us and for our industry. While any predictions as to future events must necessarily be matters of opinion, we are aided considerably in judging the future by studying the past.

R. W. THOMAS

Before analyzing the past, I will say that in my personal opinion, each of the next five years will see (a) at least 100,000 net new bottled gas customers in the United States, (b) at least 10,000,000 additional gals. of liquefied gas consumed per year by these additional customers, (c) an additional gain in gallonage per year of at least 15,000,000 for the various industrial, gas manufacturing, miscellaneous, and non-bottled gas usages, making (d) a predicted gain of at least 25,000,000 gals. per year for each of the next five years, or a marketed production at the end of 1942 at the rate of 255,000,000 gals. per year, which is over twice the estimated 1937 marketed production of 130,000,000.

The U. S. Bureau of Mines statistics on marketed liquefied petroleum gas production indicate the following remarkable progress of the industry:

1922..... 222,641 gallons per year
1927....1,091,005 gallons per year
1936..106,652,000 gallons per year
1937..130,000,000 gallons per year
(Estimated)

In the bottled gas side of the industry, there were doubtless considerably less than 20,000 domestic customers in 1927, and at the end of 1937 it is estimated that there were approximately 400,000 net bottled gas customers, consuming an average of 100 gals. per year each, or taking propane (and some butane) at the rate of 40,000,000 gals. per year. It is probable that 80,000 new customers of the bottled gas type were taken on during 1937, adding 8,000,000 gals. per year to the bottled gas consumption. This consumption per customer shows a tendency to increase due to the intensive load building efforts of the bottled gas marketers, along the lines of using gas for water heating, refrigeration, space heating, and other convenient types of consumption. Gains in consumption due to load building with improved automatic appliances are more than offsetting the trend toward decline in consumption per customer because intense cultivation of certain markets leads to the acquisition of customers with lower bottled gas buying power than has been heretofore normal. To picture the magnitude of this slightly over 10-year old industry, and its 1937 estimated sales, we can consider the 12,500 tank car loads of product which were moved in 500 special cars —a train over 100 miles long.

A few of the important reasons why the liquefied gas industry has grown rapidly, and is destined to continue to grow, are outlined hereafter.

The liquefied petroleum gas business — the fuel business — is socially and economically sound and necessary. Basic industries stand up head and shoulders above other less necessary lines of endeavor, particularly in times of depression. The liquefied petroleum gas industry is a portion of a basic industry, soundly developed and growing rapidly. It is recognized that liquefied petroleum gas is not an absolute necessity, but it has many advantages and a noteworthy profit appeal to the user, and if we continue to surround a basic necessity such as fuel with the convenience of gas and the perfection of liquefied petroleum gas service, the industry can not fail to grow and to prosper.

Conceding that energy is one of the fundamental necessities, we are confronted by a choice of energy available in many different forms and learn that energy is chosen on the basis of other than units of ability to do work; it must have a satisfactory "form value." Liquefied petroleum gas has favorable form value characteristics; concentration of energy in a small space, practically no sulphur, unvarying composition, easy control of pressure, economical transportation, etc.

Propane and butane are easily liquefiable hydrocarbons under atmospheric temperature and under commercial pressure conditions, as contrasted with natural gas (methane) which is not commercially liquefiable, and as compared with petroleum products which are normally liquid at atmospheric pressure and temperature, such as gasoline, kerosene, and the like. Hence, these liquefied gases have the favorable utilization characteristics of gases, and are also capable of being greatly concentrated by liquefaction, for storage and transportation purposes. For example, a tank car which is capable of holding 10,000 gals. of liquefied petroleum gas and which has an internal volume of about 1400 cu. ft. will hold the thermal equivalent of approximately 2,000,000 cu. ft. of city gas, or 1,000,000 cu. ft. of natural gas. In the stationary storage tanks, propane storage costs about 30c per net gal., which is equal to about $1,500.00 per MM c.f city gas equivalent, thus making the cost of propane storage less than 1/1000 of the cost of storing an equivalent amount of thermal value in the form of city gas in an ordinary lift type gas holder of large capacity.

The capital requirements for transportation and utilization equipment

(Continued on Page 84)

California's recent flood failed to damage seriously the Victorville plant of the Southwest Gas Corp. Debris is shown piled against the company's fence.

Butane Co. Maintains Service During California Flood

THE following letter from John K. Koeneman, manager of the Southwest Gas Corp., Ltd., Barstow, Calif., gives a vivid description of how the Victorville, Calif. undiluted vapor plant "took" the recent Southern California flood. The plants were designed and built seven years ago by H. G. Laub of the Southern California Gas Co., Los Angeles.

"The Victorville plant is located on Sante Fe siding property north of the tracks and close to the river. The plant lot is in a divided draw, and the 50x90 ft. lot was filled approximately four ft. before construction was started.

"The high water reached Victorville about 7 p.m. March 2 and a strong current of the Mojave River inundated the yard to a depth of over two feet. The boundary fence on the east of the yard was the first obstacle and gathered and held all of the debris. The fence washed out and was then held temporarily by a row of trees just inside the yard. Eventually the trees washed out and the whole bulwark floated over to the tanks and building where they were held. This breakwater tended to turn the water and protect the underground foundations of the three 400-gal. liquid storage tanks from washing out.

"A stock of 100-lb. bottles provided employee Charles Albert plenty of sport while the flood was running. Albert was at the plant during the whole time and it is due to his inspired work that service was maintained and damage kept at a minimum.

"The plant proper was buried to a depth of 18 in., burying the plant water heater, valves and meter. Albert allowed the plant to run on liquid until the exchanger water cooled, and by that time had dug out enough to change over to the vapor standby. Fortunately no house meters were in danger and we proudly continued our record of 'No interruption of service.'

"The Barstow plant proper was not in the flood area. However, our distribution lines were hard hit in the 'river bottom' section. Barstow being 40 miles downstream, the high water hit here about 3 a.m. March 3, doing considerable damage to residences.

"A later survey showed five service lines torn out by moving houses and it was necessary to cut off this section, carrying 28 active meters. Between the closest valve and the flooded area were 45 other active meters and, within three hours, the line was capped at the edge of the wash and service restored to the 45 accounts.

"The 'river bottom' mains have been found to be full of sand and water. On Friday night following the damage, service was restored to two-thirds of the section least damaged. So far the remaining third of the area has not been re-occupied and we are awaiting the decision of the owners before rehabilitating our lines."

I.C.C. Proposes Regulations For Liquefied Gas Carriers

A SERIES of meetings was held recently in Washington, D. C., to discuss the proposal of the Interstate Commerce Commission to extend its regulations covering rail transportation of hazardous commodities to common, contract and private road carriers engaged in the interstate transportation of such commodities. F. R. Fetherston, manager of the Compressed Gas Manufacturers Association, attended the hearing devoted to liquefied petroleum gases on behalf of C.G.M.A. and the Liquefied Petroleum Gas Association.

Copies of the proposed specifications have been circulated among member companies for comment and suggestion. Complete details can be obtained from Mr. Fetherston at L.P.G.A. Headquarters, 11 West 42nd Street, New York City.

Mr. Fetherston suggests that anybody contemplating buying new transportation equipment, should familiarize himself with the proposed I.C.C. motor carrier regulations.

■ ■

L. R. Fisher To Introduce New Pittsburgh Heater

The Pittsburg Water Heater Corp., Pittsburgh, Pa., has announced that L. R. Fisher will act as special representative for the company in introducing to the liquefied petroleum gas industry its new water heater, designed for use with all liquefied gases. The new heater is a completely automatic, fast recovery type, gas storage water heater, coming in capacities of 20 and 30 gals.

Special features of the new heater include a burner especially developed for liquefied gas, a bunsen type pilot with automatic shutoff, a positive snap action type thermostat, and the Airtrol, exclusive Pittsburg feature, which stops circulation of cold air through the heater when the main burner is thermostatically shut off. The insulation of the heavy galvanized heater tank is Rock Wool and Wyolite combination.

■ ■

New Propane Plant Serves Menard, Texas

Menard, Texas, with a population of 2500, placed in service on Feb. 10, a new $35,000 propane gas system. Financed by a special bond issue, the municipal distribution system is supplied by propane gas stored in a 15,000 gal. storage tank, located on the north side of the town, adjacent to the business district.

At the present time the municipal system is serving 220 meters, with an estimate of 325 by next winter. The business district and residential sections are served by 35,300 ft. of pipe line. The new system has been designed for possible conversion to natural gas.

■ ■

Suburban Gas Co. Moves to Livingston, New Jersey

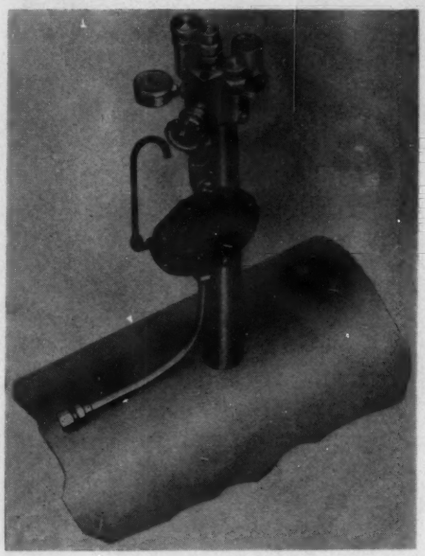
Suburban Gas Co., distributor of bottled gas in New Jersey and eastern Pennsylvania, has moved its headquarters from Verona, N. J., to Livingston, N. J. Mark Anton, president, states that the move was made in order to obtain a more central position in the distributing area developed by the company.

Bastian-Blessing Offers Unit For Underground Systems

THE Bastian-Blessing Co., Chicago, Ill., has started production on its new Rego Compact Unit Assembly for Underground Bulk Systems and expects to make shipments about the first of this month, according to word from Ellsworth L. Mills, vice president.

The new unitary valve and gage assembly answers the demand of underground bulk systems operators for a compact, simplified, safe and approved unit assembly. There is only one connection required into the storage tank. Costs are reduced because the installation of a large number of parts and pipe fittings is eliminated. Troublesome and dangerous leaks are averted.

The Rego Compact Unit outfits include all the equipment required for the assembly of a complete underground



bulk system, except the tank and housing and liquid level gage. Unit No. 2462 is suitable for loads not exceeding 50 cu. ft. of butane per hour and for use with slip tube gage; unit No. 2462A is for loads not exceeding 50 cu. ft. of butane per hour and for use with a float type gage; unit No. 2562 is for loads in excess of 50 cu. ft. of butane per hour and for use with slip tube gage; unit No. 2562A is for loads in excess of 50 cu. ft. of butane per hour and for use with float type gage.

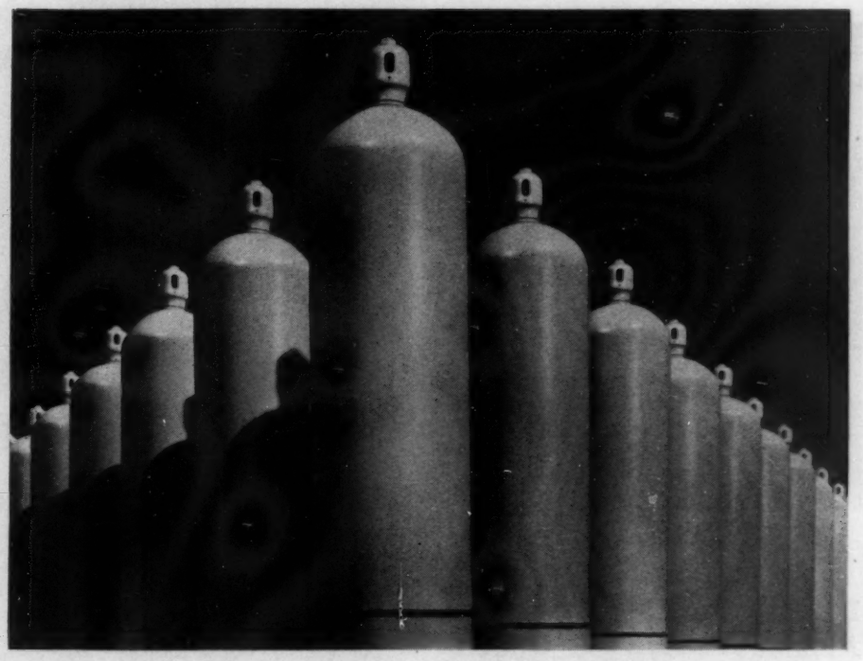
Sale of the unit, according to the manufacturer, will be confined to qualified A.S.M.E. pressure vessel manufacturers and to experienced assemblers of complete underground bulk systems. The unit complies with the National Fire Protection Association's Pamphlet 58 and with all local, state and national regulations.

Further information regarding the assembly may be obtained by writing the Bastian-Blessing Co. for catalog L-500.

■ ■

Noyes Joins Manchester Gas

Howard B. Noyes, formerly of Philadelphia Electric Co., Pa., was appointed on March 16, manager of the Manchester Gas Co., N. H. Mr. Noyes had been associated with Philadelphia Electric since 1927.



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The annual convention of the Illinois Bottled Gas Co., Chicago.

Illinois Bottled Gas Has Annual Meeting in Chicago

When the Illinois Bottled Gas Co. held its annual meeting in Chicago recently 308 bottled gas dealers were present at the Medinah Athletic Club convention headquarters.

B. D. Geroy, general manager of Illinois Bottled Gas, opened the convention program with a talk on the company's promotion plans for the year. Following Mr. Geroy, Bob Caniff, Ruud Manufacturing Co., spoke on the Ruud water heater line. After the convention luncheon Bob Gunther, Servel, Inc., spoke on the relationship of the Electrolux to the bottled gas picture.

One of the highlights of the program was the talk by E. Carl Sorby, sales promotion manager, George D. Roper Corp., who discussed the improbability of any large percentage of rural electrification for the near future. Floyd K. Lawson, sales manager of the Roper Corp., presented the 1938 line of Roper Dri-Gas Ranges.

A photograph of the many attending delegates is shown on this page.

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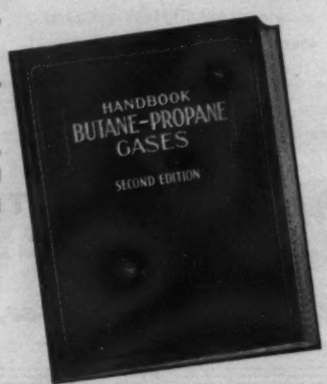

CONTENTS: Use in internal combustion engines: Design & Installation of Storage: Supply from Petroleum Refineries: Engineering Data on the Lower Olefins: Domestic Appliance Testing and Utilization: Economical Comparisons with Coal, Oil, Electricity, Producer Gas, Manufactured Gas: Town Plants: Manufacture from Natural Gas: Special Uses: Volume Correction Factors: Supplements & Revisions: Transportation: Use with other Gases: Analysis & Testing: Properties of Mixtures: Bottled Gas Distribution: Bibliography: Central Plant Directory: Catalogue Section.

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Philgas Distributor Holds Annual Sales Conference

Utilities Distributors, Inc., Philgas distributors in Maine, Vermont and New Hampshire, held its annual sales conference at Portland, Maine, the week of April 4.

Appriximately 150 were in attendance, over 100 being U.D.I. dealers. Sales promotional plans were outlined and discussed, and appliance manufacturers explained latest models.

An interesting announcement to the entire liquefied petroleum gas industry was made by Clarence E. Cooper and Co., Insurance Brokers, New York City. With the assistance of the Liquefied Petroleum Gas Association, a plan for Products Liability Insurance has been worked out for U. D. Inc. at a nominal additional cost per dealer. The plan was received enthusiastically by the conference.

■ ■

Emmetsburg, Iowa, Plant May Distribute Gas This Month

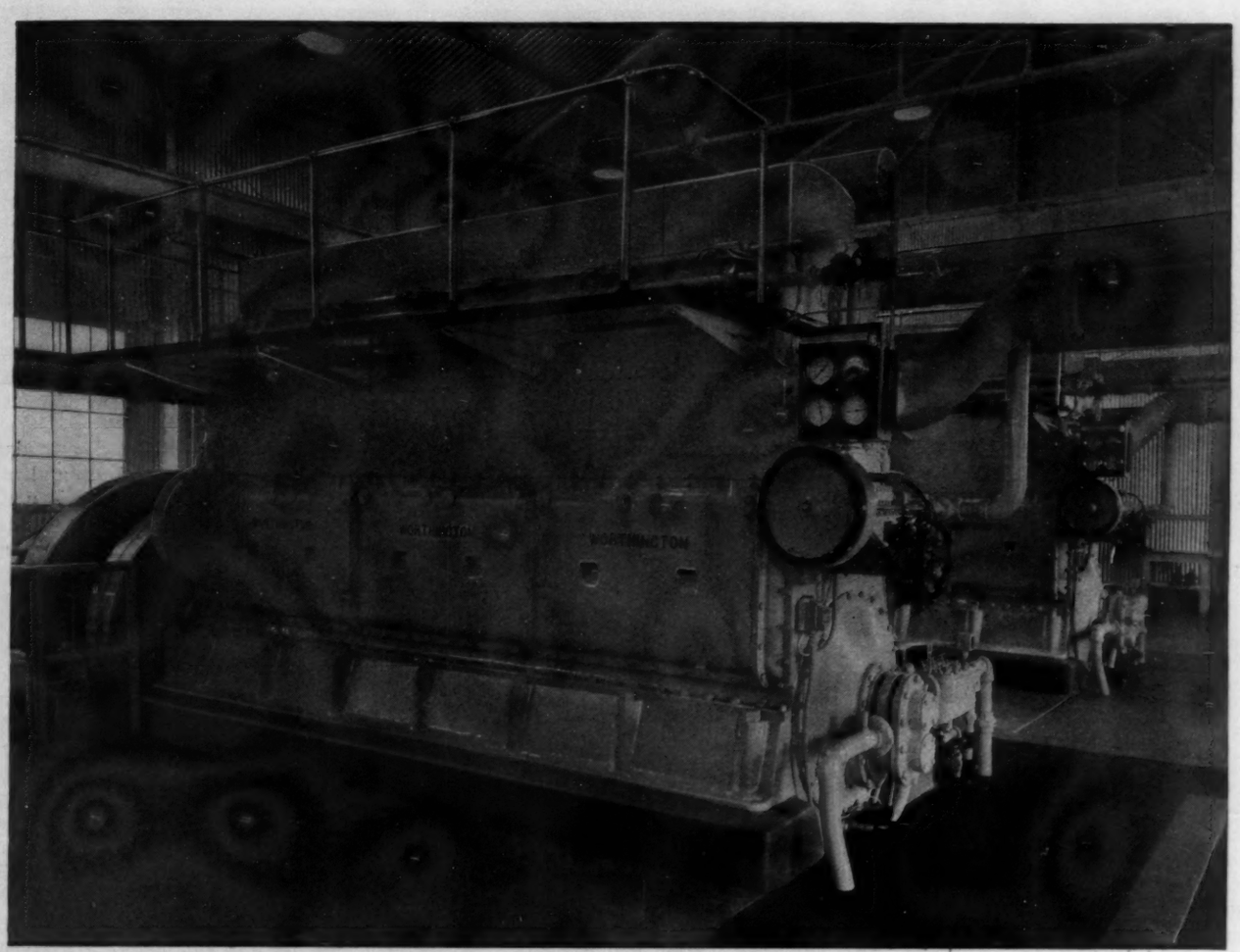
The new $79,000 propane plant, now under construction in Emmetsburg, Iowa, may have gas in the city mains by May 15, according to announcement by contractors for the Pittsburg-Des Moines Steel Co. Erection of the new gas plant, the first to be built in Emmetsburg, was started following a special election by local residents on October 14. Construction work on the mains is now being rushed to completion.

Rates, as announced by the mayor and city council, include a minimum charge of $1.25 for 500 cu. ft.; the next 500 cu. ft., 18c per 100 ft.; the next 1000 cu. ft., 13c per 100 ft.; the next 8000 cu. ft., 9c per 100 ft., and all over 10,000 cu. ft., 8c per 100 ft.

■ ■

Bupane Co. Opens Retail Outlet In Cedar Falls

The Bupane Gas Co. of Cedar Rapids, Iowa, opened a new retail outlet last March in Cedar Falls, Iowa. George Grover is manager of the new agency which will offer bottled gas for use in rural districts as well as a full line of gas appliances.



Worthington 6-cylinder 750-horsepower Convertible Gas-Diesel Engine in power plant service. This design is available in sizes of 375 to 1500 horsepower in 3 to 12 cylinder arrangements

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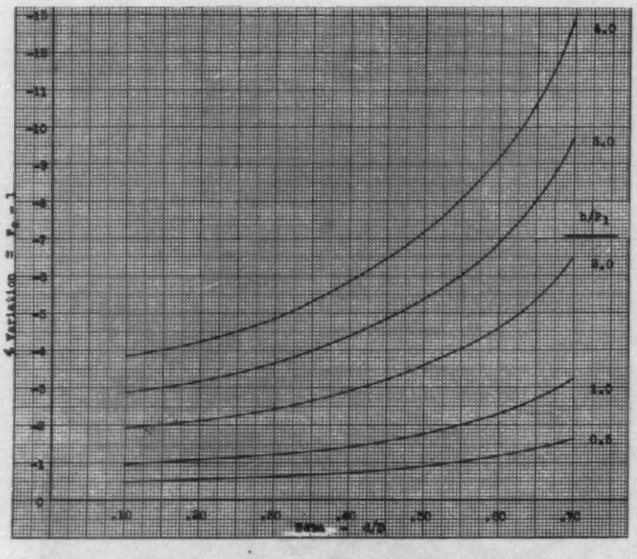


FIG. 4. Per cent variation due to expansion factor, Fe. Pipe connections, pressure upstream. (A.G.A. values).

Orifice Meter Coefficients

(Continued from Page 71)

equal to the static pressure. Records then may include the average differential, h, and average static, P, and should the average differential change by an amount greater than the average static, P, the factors should be changed. What has been said above, refers mainly to pressures below 10 lbs. gage. For pressures exceeding this amount, the factors are changed when the h/P ratio is doubled or reduced by half.

The Fr factor is obtained by dividing a given factor that applies to the physical type of meter set-up by the amount of the extension, $\sqrt{h\ P}$, and since the given factors are .10 and under, it is determined by observation that they are of relatively small value.

It may readily be seen from the above that the recommendations do present a very concise set of rules. The effect of their application to the actual meter conditions and gas volumes can better be explained by the use of graphs or charts.

The first four charts indicate the variation that would be found in metered volumes due to the expansion factor, Fe, with different h/P ratios. This is shown as per cent variation, which is true when compared with a metered volume that has not been corrected for expansion through the orifice.

Fig. 1 indicates the per cent variation due to Fe when flange taps, with downstream pressure connections are used. The vertical scale shows the per cent variation, against the horizontal scale, beta, the ratio of orifice diameter to pipe size. Referring to the recommended use of the Fe, factor, variation would be equal to the difference of the factors between any two lines. That is, with a beta factor of .30 and h/P ratio of 2.0, a change of h/P to 3.0 or to 1.0 would be the maximum variation over any period of time. It is not intended that the factors used must represent even values as 2.0 and 3.0, they may be 1.8 or 2.6, and these factors would be permitted to vary to 1.0 plus or minus of that value under normal operating conditions. It should be noted that with the flange connections and pressure connections downstream as shown in this plate, maximum variation expected would be less than 0.7 per cent.

Fig. 2 illustrates the same factors with the pipe connections and pressure downstream. The variation expected here would vary according to the beta factor, from a plus to a minus correction. The maximum variation which would occur at high values of beta, would be less than 1.25 per cent.

Fig. 3 shows flange connections, pressure taken upstream. The per cent variation is greater here than the flange with downstream connection, with a maximum of 1.2 per cent.

Fig. 4 illustrates pipe connections, upstream pressure taps. Again, the variation is greater than for the same connection with downstream pressure taps. The maximum per cent variation varies here, from about 1.0 per cent with a beta of .10 to a maximum of over 3.0 per cent with a beta factor of .70.

These variations in the day to day meter chart are compensating, and for that reason an average value is used in determining the factors for determining the gas volume. The recommendations are intended to simplify the procedure as to how often and when it is necessary to change the factors, when the differential and static are changing from time to time.

It is interesting now to compare the variations as found with the different physical meter set-ups and expansion factor, Fe, with some of the other factors that enter into the computation of the coefficient and gas volume.

Fig. 5 illustrates variations of gas volume with changes of gravity. With a gravity of 1.000, a change of .020 will produce a variation of 1.0 per cent in the gas volume. A gravity of 1.500, needs a change of .030 for the same 1.0 per cent variation. Though no chart has been made of temperature variation, it requires about 10 degrees for a 1.0 per cent change in gas volume.

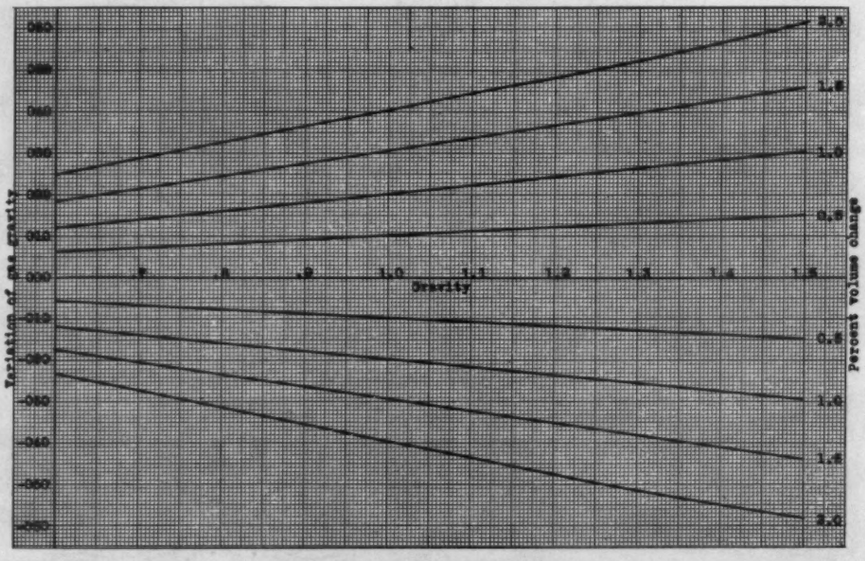


FIG. 5. Variation of gas volume with variation of gas gravity. Temperature constant. Orifice meter measurement.

Another Eye-Cripple

Don't put yourself or your employees at the mercy of poor lighting. Science has provided a definite technique for lighting your store, office or factory exactly as it should be lighted—for greatest eye-comfort. Such lighting need not be expensive and it is certain to pay dividends in better appearance, greater personal efficiency and generally improved morale among workers. These results have been obtained by many local firms and we will be glad to show you specific cases. Consult our local office and make arrangements for a scientific estimate of your lighting needs. There is no charge.

P·G·and E·

PACIFIC GAS AND ELECTRIC COMPANY

Owned—Operated—Managed by Californians

G105-538

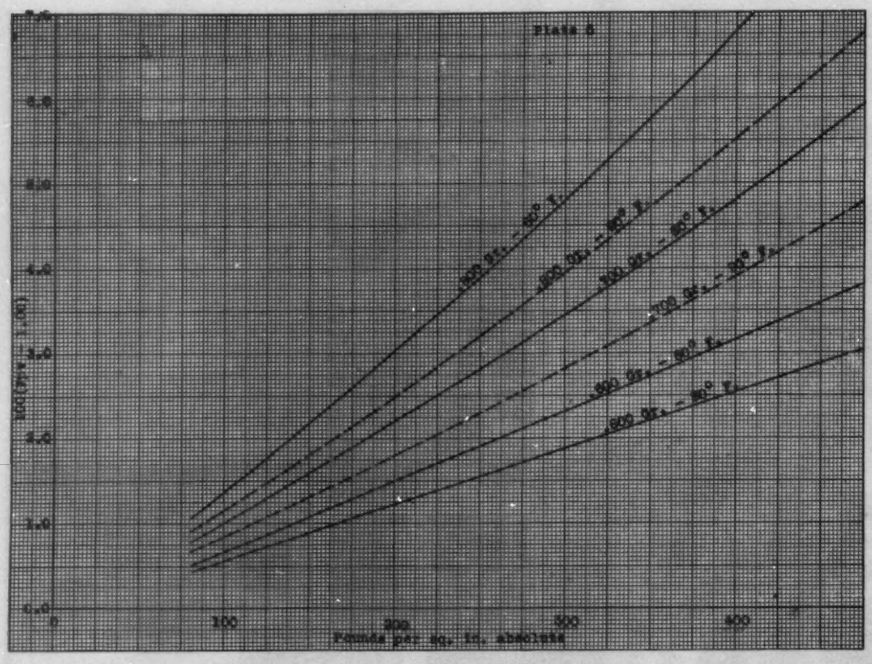


FIG. 6. Fpv factor. Effect of gravity and temperature. Orifice meter measurement.

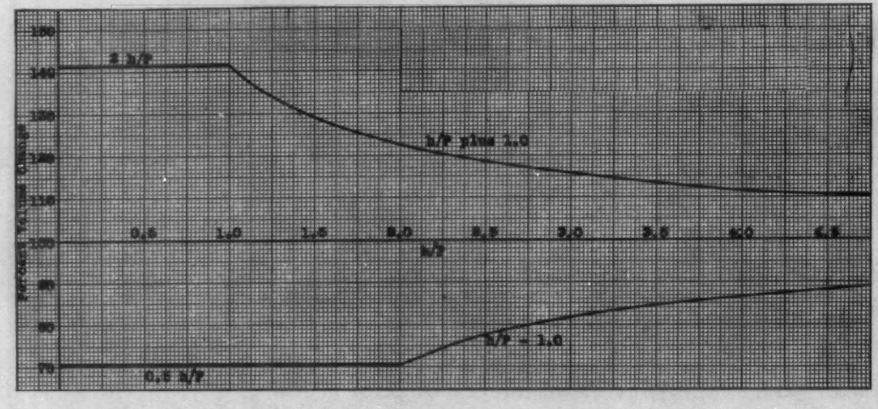


FIG. 7. Gas volume relationship. Per cent change of gas volume with changes of h/P ratio as recommended. Constant pressure.

Fig. 6, Fpv factor: though the use of supercompressibility factor has been recommended, no other definite rules have been included in this report. This chart will indicate the reason for this. The variation in volume for any difference of pressure, will change with temperature as well as with the gravity of the gas. It therefore becomes more of a problem of the operator to maintain the Fpv factor in line with the accuracies of his physical meter set-up, and the variations permitted in the use of the other factors. A further reason is that no Fpv factor has been formulated other than the C.N.G.A. bulletin. The A.G.A. report states that the actual compressibility factor of the gas be determined by test.

Referring to the first charts, showing the variations of volume with the Fe factor, maximum variations in volume to be expected varied from less than 0.7 per cent for a change of h/P ratio of 1.0 in the flange connection, to an extreme of about 3.0 per cent. The following is taken from the A.G.A. Report No. 2, Appendix B, "Derivation of Formulas and Method of Calculation of Tables."

"(B 9) The coefficients calculated from these equations apply to orifices constructed and installed in accordance with the instructions of Section 11, provided the pipe is not less than 1.6 in. inside diameter and the diameter ratio is between 0.10 and 0.75. Under these conditions coefficients calculated for flange taps by the above equations are subject to a tolerance of plus or minus 0.5 per cent, when an incompressible fluid is used and the diameter ratio is between 15 and 70 per cent. When the diameter ratio is less than 15 or greater than 70 per cent, the tolerance is to be increased to plus or minus 1.0 per cent. For pipe taps, the tolerance is plus or minus .75 per cent for diameter ratios between 20 and 67 per cent, and may be as high as plus or minus 1.5 per cent for diameter ratios below 20 or above 67 per cent."

Fig. 7, Gas Volume Relationship: under conditions of constant static pressure and changing the differential and h/P ratio, this curve indicates the change of gas rate possible under average conditions before a change of the coefficient was necessary to maintain the factors within the limits of the four recommendations previously listed. It may be seen that below a ratio of 1.0 (h/P), the volume may vary from the average as found to a new average flow that would be 141 per cent of the initial flow or as low as 70 per cent of the initial flow without the need of changing the factors, Fe and Fr. As the h/P ratio is increased to 4.5, the limits are reduced to 111 per cent and 88 per cent. The largest changes of volume are possible under the lower h/P ratios. These changes are made under an almost constant tolerance. It might be noticed from this curve that such factors as doubling the ratio or reducing by half permit of a constant increase or decrease of volume but also permit of greater variation in accuracy with the higher h/P ratios.

The committee wishes to express its thanks for the consideration given this work by the various companies and those individuals whose suggestions and assistance were so freely given. It is hoped that the recommended outline will fill a demand for a procedure for the use of the coefficient data.

■ ■

Gas Meter Mercury Thieves Apprehended in Oklahoma

Theft of mercury from orifice meters has been put to an end in Oklahoma, following the apprehension of Hobart E. Alexander, alleged leader of a ring of thieves operating through the oil district in nine Oklahoma counties. During the past six months $10,000 worth of mercury, tapped from meters set at isolated spots in oil and gas fields, and oil field equipment has been stolen.

The apprehension of the thief was accomplished with the aid of a trap designed and installed by Bruce Nichols, engineer for Consolidated Gas Utilities Corp., Oklahoma City. The trap consisted of three units: the "rat trap" used to discharge tear gas; the automatic camera; and the mercury switch which set the equipment into action. As a result of the use of the trap, Oklahoma investigators obtained a photograph which established the identity of the thief when he entered a meter house, March 23.

1938
P.C.G.A. COOPERATIVE ADVERTISING CALENDAR

P. C. G. A.
Norman R. McKee, President
Clifford Johnstone, Managing Dir.

MAY

COMMITTEE
A. C. Joy (Chairman), P. G. & E.
J. S. Spaulding, So. Calif. Gas Co.

. . . with modern GAS appliances

SUNSET PLAZA APARTMENTS
WEST HOLLYWOOD
Architect Paul R. Williams
Assc. Arch. Lester G. Scherer

Eighteen perfect small homes under one roof! Designed for the California climate—with generous light and air, gardens, tennis court and outdoor pool. ☆ Year-around comfort, carefree housekeeping and gracious living are assisted by quick, clean, economical gas appliances. ☆ *Architects, builders, owners are invited to use the Gas Company's free engineering service.*

THE *trend* in apartment house design—individual homes under one roof, instead of cubicles opening from long halls. ☆ *The problem*—individually controlled heating. ☆ *The solution*—forced air, unit gas furnaces, thermostatically regulated by each family according to personal needs. ☆ There's a modern gas range in each kitchen of course; and low-cost, dependable hot water is automatically supplied with gas. ☆ Would you as an owner ever lack desirable tenants for such a property? Would you as a tenant be likely to leave it for any other home?

GAS
THE MODERN FUEL

COOKING · HEATING · HOT WATER · REFRIGERATION

WHAT'S NEW ?

Your Cooperative Advertising Committee conducts a constant search for the newest and most modern adaptations of gas-fired equipment. ★ One example is described in this advertisement for architectural trade journals, featuring "the latest" in apartment house design and heating. (Appearing in *Architect & Engineer* and *California Arts & Architecture.*)

Future of the Liquefied Gas Industry

(Continued from Page 75)

are lower for a liquefied gas than for any other generally available form of energy. Electricity must be generated, transmitted and consumed simultaneously, therefore the entire system must be made capable of taking the highest instantaneous peak load that is ever expected to occur. No commercially feasible means of storing electricity in large quantities has ever been devised. In the case of city gas, production and consumption do not need to be simultaneous as the energy in the form of gas can be stored in a reasonably economical manner in high or low pressure holders, by packing pipe lines under pressure, etc., hence there is some fly wheel effect between the producing and consuming ends of the system. Liquefied gas is even more independent of its source of supply owing to its economical transportation and storage characteristics.

The liquefied gas industry has been built up rapidly over a span of a few years, as a result of conservative marketing coupled with a common sense scientific approach to problems such as rates, mechanical matters, merchandising, advertising, etc. Wide diversity of usage and of markets has helped the industry, particularly during the depression times. The liquefied petroleum gas business showed substantial gains in gallonage even during the worst of the depression years.

The industry has followed a forward looking policy of making installation charge and rate reductions as rapidly as the economics of the business would justify. This has resulted in a relatively orderly development of a virgin market, giving the customer the greatest possible value for each dollar spent. Contrary to the old fashioned practice in some enterprises, the liquefied gas industry has made strenuous efforts to improve the gas-consuming appliances and to develop their efficiencies with the avowed intention of reducing the consumers' volume of gas used to produce a given result, again illustrating the advantages to both marketer and consumer of proper application of engineering and research toward efficient use of the energy and the economic advantages to be derived therefrom.

It is probable that electricity will eventually become a major competitor of bottled gas for domestic cooking beyond the gas mains. Of the approximately 30,000,000 families in United States, over 16,000,000 use gas — manufactured, natural, or bottled gas. There are reported to be 6,800,000 farms in the United States, of which over 5,000,000 are without central station power. Recent statistics indicate that the Rural Electrification Administration budget totals 85 millions available up to June 1938. At the minimum rate of $1,000 per mile for rural lines, this money will build a maximum of 85,000 miles of line, which will serve not over 300,000 rural customers. This rural electrification program, even if continued on the present scale, will hardly make a dent in the tremendous available rural cooking market. Coal, wood, oil, and gasoline are still used for cooking purposes by over 12,000,000 United States families, with the balance or some 2,000,000 electric ranges in use. In 1936, the gas industry statistics show that 1,464,000 gas ranges were sold and the 1937 estimate indicates approximately a 10 per cent increase over 1936, or 1,600,000 gas ranges sold. This is indicative of the fact that gas has gained, and is holding almost universal acceptance as the logical and economical cooking fuel.

Non-Domestic Uses

Outside of the domestic market, numerous new uses of the liquefied gases have been developed. Among them is the use of propane for fueling gas-fired engines on railroad cars for driving air-conditioning units (*GAS*, February, 1938, p. 46) and for turning electric generators. The use of liquefied hydrocarbons for raw materials for chemical synthesis and polymerization is expanding by leaps and bounds. The economic value of liquefied gases for these non-fuel purposes is generally considerably less than that obtained in the fuel markets, hence it is not likely that the competition between these various uses for the same products will result in any dearth of raw material for the fuel or energy purveying section of the liquefied gas industry. With a relatively unlimited supply of raw material and a huge market which has not even approached a saturation point, the liquefied gas industry is destined to continue to grow and to prosper.

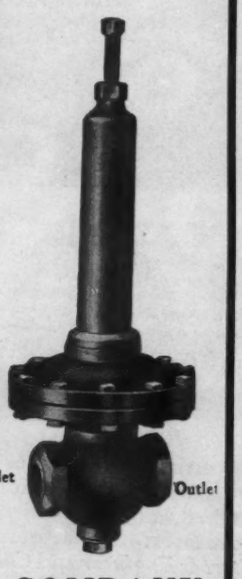
In addition to the estimates of future gallonage sales of the liquefied

SAFEGUARDING PRESSURE

FULTON
SPRING TYPE
REGULATOR

Especially recommended for use in remote, out-of-the-way places. Its compact and light-weight design reduces handling and installation costs. Preferable in such places to a regulator of the lever type as it protects itself against tampering or injury by weather.

Equipped for high pressure, it reduces from 300 pounds to any desired pressure between 10 and 50 pounds. For low pressure, reduces from a maximum of 50 pounds to any outlet pressure not exceeding one pound. Catalog on request.



THE CHAPLIN-FULTON MFG. COMPANY
28-40 Penn Avenue Pittsburgh, Pa.

REPRESENTATIVES

WESTCOTT & GREIS, Inc.
Sales and Service
Dallas — Tulsa

JNO. W. CRAWFORD
Sales Engineer
1855 Industrial Street, Los Angeles

PARSONS ENGINEERING CO.
Los Angeles, Calif. San Francisco, Calif.

OR ANY JOBBER

gas industry, given earlier, a few other important economic facts, which have a bearing on the future of the industry and on the conduct of the units making up the industry, are very pertinent. The forthcoming higher rail freight rates will undoubtedly lead to even more widespread use of trucks for transportation, particularly on movements in cylinders over a relatively short distance. This will also accelerate the trend toward lighter cylinders and the use of high tensile alloy steels for these shipping containers. This subject will doubtless be an important one for C.G.M.A. consideration during the next few years. The trend toward greater efficiency of sale and distribution and more economical handling of liquefied gases makes lower prices possible to the customers and in turn leads to broader and more diversified markets. The tendency in the industry is to use more propane and less butane because of the several natural physical advantages inherent in the propane. The industry, particularly the bottled gas section, will see continued high capital requirements, with possibly lower percentage earnings on the money invested. There will be a continued and perhaps increased intensity of competition, which will probably cause some of the less efficient and less ably operated marketers to drop out of the picture. In spite of and because of these factors, it is confidently expected that the liquefied gas industry will continue to be reasonably profitable, and it will remain a stable and highly diversified business if those participating in it are willing to conduct it on a safe, conservative and common sense basis.

■ ■

Butane Sales Co. Organizes In Montgomery, Alabama

With Carl C. Hughes, San Antonio, Texas oilman, as president, the Butane Sales Co. recently filed certificates of incorporation in Montgomery, Ala. Under the articles of incorporation the new company will "buy, sell, distribute, and serve liquefied petroleum products for heating, lighting and power, and all other industrial, commercial and domestic uses." The company is also authorized to own and operate gas wells and butane gas plants.

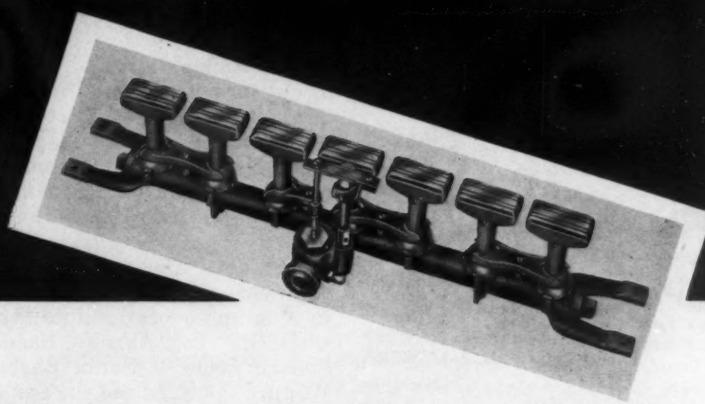
Other company officers, besides Mr. Hughes, include Paul M. Jones, Montgomery, and J. S. Kinney, Cullman, vice-presidents; W. C. Hughes, Birmingham, secretary-treasurer.

■ ■

Naile Is Lebanon President

William Naile is now president of the Lebanon Valley Gas Co., Pa. Prior to his election Mr. Naile was distribution engineer, Operating Department, United Gas Improvement Co.

Pacific MULTI-TUBULAR BURNERS



PERMANENTLY ADJUSTED FOR THE KIND OF GAS USED IN YOUR TERRITORY

SERVICE CALLS REDUCED— YOUR PROFIT INCREASED!

Pacific Multi-Tubular Burners are TAMPER-PROOF. You insure yourself against profit-loss from service calls for adjustments when you install Pacific gas heating appliances equipped with the proper Multi-Tubular Burner for the type of gas to be used. Each Pacific Multi-Tubular Burner is a complete, independent blue-flame Bunsen burner, drawing its own air and gas supply in EXACTLY the right proportions for lowest operating cost.

Orifices are drilled and adjusted at the factory to insure a permanent, scientific fuel-air mixture for the particular type of gas to be burned in the appliance. There is a standard Pacific Multi-Tubular Burner for Butane, Propane, Natural or Artificial Gas, arranged in the cluster or long type, depending on the design of the appliance.

Pacific Built-In Safety Control— *An Exclusive Feature*

This complete safety device automatically shuts off the gas supply to the pilot as well as to the burners, if there is any interruption in the service. It is an exclusive, patented feature of vital importance, and is furnished as standard equipment on Pacific gas heating appliances.

Whether your business is in the residential, commercial or industrial fields, GET ALL THE FACTS about the complete Pacific line of gas heating appliances for all kinds of gas.

Pacific Makes This Complete Line of Gas Heating Appliances For All Kinds of Gas:

THERMOLATORS
RADIANT CIRCULATORS
WALL HEATERS
RADIANT HEATERS
FLOOR FURNACES
GRAVITY FURNACES
BLOWER FURNACES
INDUSTRIAL UNIT HEATERS
FORCED-AIR UNITS
WATER HEATERS

WRITE TODAY FOR CATALOG BG538

PACIFIC GAS RADIATOR CO.
1740 W. WASHINGTON BLVD., LOS ANGELES, CALIF.
Manufacturers of the Most Complete Line of Gas Heating Appliances in the West

In Los Angeles
it's the
HOTEL
CLARK
Fifth and Hill

555
Rooms-Baths

from $2.50 PER DAY

Famous for Good Food from Coast to Coast

RIGHT down-town in the center of things. Easy chairs, sleep-inspiring beds, large rooms with luxurious fittings.

P. G. B. MORRISS
Manager

Natural Gas Supply in the United States

(Continued from Page 30)

proximately, of the total production of the State was dry gas, the balance being casinghead.

The principal oil and gas deposits in California are found in thick, prolific formations of Tertiary Age. Accumulation of oil and gas is governed by structure with much of the folding and faulting occurring in comparatively recent time. Many of the structures are expressed in the surface topography. The productive oil and gas fields may be grouped according to geographic location into three divisions, the Los Angeles Basin fields, Coastal fields of Santa Barbara and Ventura Counties and the San Joaquin Valley fields.

The principal reserves in California are found in a relatively small number of fields of large capacity, notably at Kettleman Hills, Ventura Avenue, Huntington Beach, Long Beach, Santa Fe Springs, Dominguez, Buena Vista Hills and North Belridge. The Kettleman Hills field has been the State's principal source of natural gas supply since its discovery in 1929. During recent years, extensions to the main producing zone and the discovery of production in the deeper, 11,000-foot level have added substantially to the known gas and oil reserves of this field. A similar extension and discovery of deeper production in the North Belridge Field have added important reserves to that area. Deeper development in these fields and at Huntington Beach and Dominguez continues to add to the gas supply of the State and it is not unlikely that deeper drilling in other known productive areas will continue to discover horizons below those yet developed for some years to come. In addition to the above, all of which are closely associated with the oil reserves, important discoveries of dry gas at Rio Vista, McDonald Island, Greeley, Ten Sections and a number of other smaller discoveries have added to the proven supply. Recently we have estimated the gas reserves of the state at 6.9 trillion cu. ft. which we consider to be the volume of gas which will be produced in the present known fields and will be available at the surface for all purposes including gas used in lease operation and that which is unconserved. At the current rate of production, approximately 350 billion cu. ft. per year equal a 20-year supply.

Summary

We have seen that the known natural gas reserves of the country taken as a whole are equivalent to approximately 30 years' supply based on the recent average market demands. We may expect market demands to increase. We may expect additional important discoveries of gas particularly in the Gulf Coastal region, in the deeper sands in California and in modest degree in many other parts of the country. Nevertheless it is practically certain that shortages of natural gas will develop in certain places now having an ample supply long before the natural gas supply as a whole is nearing exhaustion.

■ ■

News and Yearbook Issued by Rochester Gas and Electric

The Rochester Gas and Electric Corp., Rochester, N. Y., has recently issued its March-April 1938 Yearbook which presents an illustrated resume of the progress made by the company during 1937.

Included in the 70-page booklet are accounts of the company's home service activities, advertising campaigns, purchasing problems, sales contests, etc.

FOR YOUR INFORMATION—

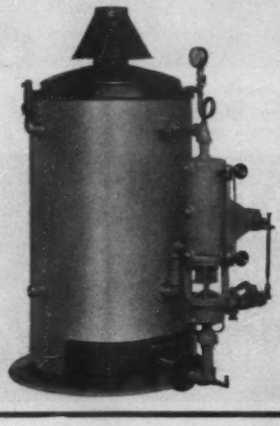
recent tests conducted to determine safety from a fire hazard standpoint in connection with Gas Vents and Flues proved METALBESTOS to be without equal in the field of improved types of gas venting materials.

METALBESTOS is a pipe scientifically designed and constructed for venting gas appliances—not just a pipe incidentally used for this purpose. It is made in both round and oval shapes and in 3 ft. and 10 ft. lengths in all sizes.

WRITE FOR DESCRIPTIVE CATALOGUE AND PRICE LIST TO

WILLIAMS - WALLACE COMPANY

160 HOOPER ST. SAN FRANCISCO, CALIF.



INDUSTRIAL
GAS BOILERS

Plain tubular..... ¾ to 10 H.P.
Water Leg tubular..... 5 to 45 H.P.
HE Flueless ..... 1 to 18 H.P.

ASME Code for 100 lbs. S.W.P., also for higher pressures.
Non-electric Low Water Cut-offs for all types of boilers.

P. M. Lattner Mfg. Company
CEDAR RAPIDS IOWA

One Company's Experience With Air Conditioning

(Continued from Page 28)

the close of this cooling season. As regards first cost, the total installed cost of the plant at Santa Ana in round figures was $6700. All equipment except the cooling machine alone (representing a cost, here, of about $2200), was purchased at retail, by contract, as any purchaser would buy it. All of our own men's time was marked up, giving approximately the same amount as the retail purchase price of such labor. If a conventional electric machine were to be installed, the expected bid price would be between $7000 and $7500 for the same quality of equipment throughout. If the cost of the equipment purchased (excluding freight) be marked up 25 per cent on selling price, then the cost to the purchaser of such an installation would be some $7300, a figure definitely competitive with equipment of comparable quality. This type of installation will not compete in first cost with the cheapest electric equipment available, but then an Electrolux does not compete in first cost with a Coldspot, and the gas industry has certainly sold a lot of Electrolux refrigerators. It can do as well in the comfort cooling field as soon as the equipment can be widely distributed.

■ ■

Delaney and Olinger Direct Revised Company Divisions

E. R. Rothert, manager of the gas commercial department, Union Light, Heat and Power Co., Cincinnati, Ohio, has announced the revision in the executive branches of his department since the death of Dr. E. W. Esslinger, supervisor of the Industrial Gas division. The Bakery, Hotel and Restaurant sales group, formerly part of the Industrial division, is now a division of Gas Commercial with J. R. Delaney as supervisor. The Industrial Gas division is supervised by Stanton T. Olinger.

■ ■

Regional Sales Conference To Be Held In New York

The 1938 New Jersey Regional Gas Sales Conference of the American Gas Association will be held May 18-19 at the Hotel New Yorker, New York, N. Y. W. J. Schmidt, Long Island Lighting Co., Mineola, N. Y., and chairman of the New Jersey Gas Sales Council, will act as general chairman of the conference. Plans for the coming convention were approved at the Regional Council meeting, held March 25, in New York.

■ ■

A. E. Faine, Statistician, Dies

A. E. Faine, well known statistician in the gas and oil industry and resident of Straitsville, Ohio, died March 4 at the Marietta Hospital in Ohio.

N. E. F. S. I.

Located 10,000 Gas Leaks Last Year

For 200 Gas Companies in 25 States

While only a part of its service pertains to locating leaks, more than 10,000 gas leaks were located in 1937 at an average cost of $2.36 per leak. The average cost per mile surveyed was $1.83. Leaks were located on an average of one per 1¼ miles surveyed.

N.E.F.S.I. also determines the cause of damage to trees and shrubs whether due to drouth, change of grade, defoliation by leaf eating insects, etc., or any other factors. These reports protect the utility against claims for alleged damage. Evidence furnished has proved useful in reducing large claims to small and has also caused claims to be thrown out entirely.

Let us locate your leaks before they become of major proportions. Service recognized by American Gas Association. It more than pays for itself in reducing unaccounted for gas.

A PARTIAL LIST OF GAS COMPANIES USING SERVICE:

BOSTON CONSOLIDATED GAS CO.
BROOKLYN BOROUGH GAS CO.
BROOKLYN UNION GAS CO.
CENTRAL HUDSON GAS & ELECTRIC CORP.
DUKE POWER CO.
HARTFORD GAS CO.
INDIANA GAS UTILITIES CO.
JERSEY CENTRAL POWER & LIGHT CO.
NEW HAVEN GAS LIGHT CO.
NORTHERN INDIANA PUBLIC SERVICE CO.
OWENSBORO GAS CO.
PEOPLES GAS LIGHT & COKE CO.
ROCHESTER GAS & ELECTRIC CORP.
ATHOL GAS & ELECTRIC CO.
WASHINGTON GAS LIGHT CO.

New England Forestry Service Inc.

MILTON W. HEATH, President

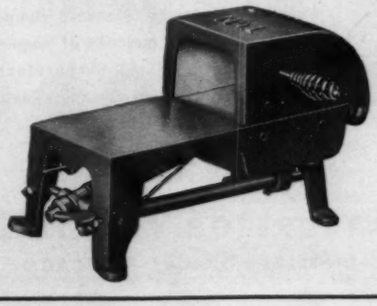
75 FEDERAL STREET BOSTON, MASS.

"Trees, Like Humans, Respond to Proper Care"

©1935

Speed Up Your Work and Cut Costs With a Johnson No. 1 Soldering Furnace

Use this powerful, economical Soldering Furnace for heating soldering copper up to six pounds per pair, and heat-treating, tempering and annealing small carbon steel tools. No forced air-blast or blower required. The patented curved hood forces a return blast over the work, and a heavy refractory lining insures uniform heat. Fired by one Johnson Patented Direct Jet Bunsen Burner. Write today for free catalog of the complete line of Johnson Metal Working Gas Appliances.



JOHNSON GAS APPLIANCE CO. Cedar Rapids IOWA

The 33rd Mid-West Convention

(Continued from Page 34)

A.G.A. gave the latest facts on the A.G.A. national advertising program. C. B. Winkler, the Capex Co., Chicago, dealt with display advertising, and Bernard T. Franck, sales manager, Grand Rapids Gas Light Co., gave practical ideas on "Home Service, What It Should Be and How It Should Operate." The last speaker for the day was B. D. Geroy, general manager, Illinois Bottled Gas Co., Chicago, who spoke on "Bottled Gas Beyond the Gas Mains."

The second day of the conference began with an 8:45 Tom Collins Breakfast and ended with the convention's annual banquet over which F. C. Hoffman of Northern States Power Co., St. Paul, presided as master of ceremonies.

H. C. Valentine, Peoples Gas Light & Coke Co., presented "Blab, Blurb and Bluster, an Introduction to Gas Semantics," following the breakfast. In highly entertaining fashion he exploded certain philosophies of selling and advertising and made a plea for the use of simplicity of expression and of easily understood words.

J. J. Bonner, sales manager, Welsbach Co., Gloucester City, N. J., in talking on automatic gas water heating, emphasized the 1938 Gas Water Heater Prize Parade, urging utilities and their dealers who have not joined up to do so at once. In connection with automatic gas water heating, Mr. Bonner recommended that the industry "sell the cupful rather than the tubful," also that water heater selling be disassociated from dish pans and drudgery and the kitchen door sales approach. Another approach suggested was "hot water for Beauty's sake."

The 1938 Gas Refrigeration Campaign, which was discussed by Adolph Jansen, Jr., sales promotion counsellor, 1938 A.G.A. Refrigeration Committee, is based on the theme, "Making Every Minute Count," and the industry will benefit right now from the campaign, said Mr. Jansen.

E. Carl Sorby, sales promotion manager, George D. Roper Corp., brought the morning to a rousing close with his entertaining and profitable talk entitled, "Working Wonders with Low Temperature on a Modern Gas Range."

Amos H. Abbott, gas engineer, Northern States Power Co., brought a report as industrial representative of A.G.A. following which Frank C. Smith, president, Houston Natural Gas Co., described the Full Dealer Co-operative Plan of his company, pointing out the various steps in the program which include the making of an annual consumer survey in the interest of dealers, the supplying of free display space in gas company offices, a complete service for preparing advertising material, solicitation by gas company employees in the interest of dealers, the providing of identical finance terms and the preparing of sales helps, portfolios and booklets.

Mr. Smith stepped away from his general theme at one point to recommend the establishment by the gas industry of An Institute of Gas Research to provide scientific research for developing new products and as a protection against the encroachment of the electric industry.

Gas Engines for Power

E. J. Hatzenbuehler, chief industrial engineer, Lone Star Gas Co., Dallas, related the experience of his company, which serves gas in 300 cities and towns in Southern Oklahoma and Texas in "Developing Additional Load Through Gas Engine Power." He discussed the subject both from the standpoint of the technical operation of the gas engine and from the sales promotion angle. (See page 35).

In connection with the Natural Gas Supply of the United States, Ralph E. Davis of Ralph E. Davis, Inc., Pittsburgh, first traced briefly the history of the industry in expanding its facilities, then dealt with the gas reserve situation in the United States. (See page 29).

He stated that the known natural gas reserves of the country taken as a whole are equivalent to approximately 30 years' supply based on the recent average market demands. He anticipates an increasing market for gas and says that the industry may expect additional important discoveries particularly in the Gulf Coastal Regions, in the deeper sands in California, and to a modest degree in other parts of the country.

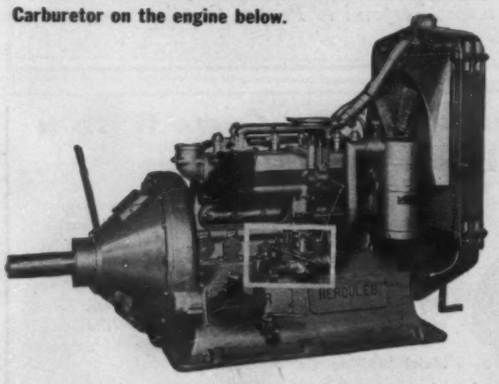
Frederick H. Stinchfield of Minneapolis, past president of the American Bar Association, brought the day's program to a close with an address on "Whom Do We Envy?" The banquet was held that evening.

A. C. Rathkey, Iowa Public Service Co., Waterloo, presented the report of the A.G.A. technical representative as first speaker on the closing day.

Lester J. Eck, Minneapolis Gas

LEADING ENGINE BUILDERS CHOOSE ENSIGN

For more than 22 years, HERCULES has devoted its entire facilities solely to the making of internal-combustion engines. ENSIGN Gas Equipment is standard at the Hercules factory. Note the ENSIGN Natural Gas Carburetor on the engine below.



See Our Exhibit
INTERNATIONAL PETROLEUM EXPOSITION
TULSA
MAY. 14-21

ENSIGN precision products for the efficient, economical carburetion of internal combustion engines consist of Gas, Combination Gas and Gasoline, and Butane Carburetors of superior principle and design. Standard equipment with a large majority of engine manufacturers, ENSIGN Carburetors have always proved outstanding values.

For the BEST in CARBURETION ...equip with ENSIGN!

ENSIGN CARBURETOR CO., LTD.
LOS ANGELES · DALLAS · CHICAGO

Light Co., pointed out the value of customer satisfaction in a paper on "Service Methods and Policies" and recommended the spending of money to keep the customers' good will without making them feel that they are receiving something for nothing.

W. J. Grover, Surface Combustion Corp., Toledo, in a paper on house-heating showed why people buy gas heat, basing his talk on a survey made by his company. The survey developed the following 11 reasons why automatic heat was purchased: to avoid effort, save money, for enjoyment, for cleanliness, for comfort, for health, to save time, to protect family, to conserve possessions, to emulate others, for beautiful possessions.

As a second subject under House Heating, E. M. Kennedy, Iowa Nebraska Light & Power Co., Lincoln, covered the subject, "Reducing Those High Bill Complaints." His company had found that in the majority of cases the high bill complaint was not a complaint, but an inquiry which gave the opportunity to review relationship with the customer.

The convention was concluded with a talk on "Air Conditioning with Gas" by H. C. Gurney, Surface Combustion Corp., Chicago, and with the report of the Resolutions Committee brought by H. B. Maynard, Iowa Public Service Co., Waterloo.

The registration at the meeting was approximately 275 with a considerably larger group than this attending.

The Committee on General Convention Arrangements was H. E. Peckham, St. Paul, chairman; G. O. House, St. Paul; Louis Stein, Minneapolis; Fred Hoffman, St. Paul; H. Putnam, St. Paul; Amos Abbott, Minneapolis; Austin Schuldt, St. Paul; Lester J. Eck, Minneapolis, Chet Lyford, Minneapolis, and E. J. Boyer, Minneapolis.

■ ■

A Chicago Utility Surveys 7,358 Heating Customers

(Continued from Page 25)

Interviews such as the one described above were repeated throughout the city until the "sample" was completed. The operation required between three and four months.

When the results were announced in the staff meeting, this is what they showed:

Of the 7,358 customers who were interviewed, 7,042 declared themselves satisfied with gas heating service. In other words, 96 per cent of these families, after one or more years of actual experience, classified themselves in the "satisfied customer" group!

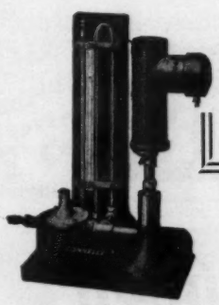
CONNELLY

PURIFICATION Of Sour Gas

This can be accomplished at relatively low cost by the use of Connelly IRON SPONGE. It is furnished in various concentrations of active ingredients to suit any requirements. Write for our assistance. We have had sixty-two years' experience in this field. Bulletin No. 100B-1 contains helpful information. Send for your copy.

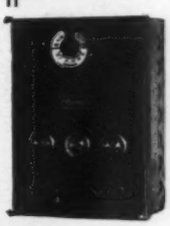
A ready-to-use mixture of active, hydrated, alkalized iron oxide only for local mixing, or furnished prepared with Connelly selected wood filler, insuring high capacity for sulphur removal.

Positive BTU Control



Caloroptic with U-gauge, pressure regulator and burner unit.

The Connelly Caloroptic is a Direct-Reading BTU indicator with control panel for operating a power circuit. It can be used to advantage in mixing natural, manufactured or butane gas. Simple, accurate and inexpensive, this reliable instrument is an important aid in gas production. Ask for Bulletin No. 405 B-1.



Distant signal unit with lights or alarms for remote control.

CONNELLY IRON SPONGE & GOVERNOR COMPANY
Chicago, Illinois — Elizabeth, N. J.
Pacific Coast Repr: Harry V. Payne, 3834 Third Ave., Los Angeles, Cal.

STANDARD PRODUCTS

THAT ARE *Kitson Standard*

Made from finest Quality Metals, carefully machined to exacting specifications. Each thoroughly tested, before leaving the factory, for ease of operation and freedom from leakage.

G-501—Flathead Iron Body Brass Plug Gas Stop

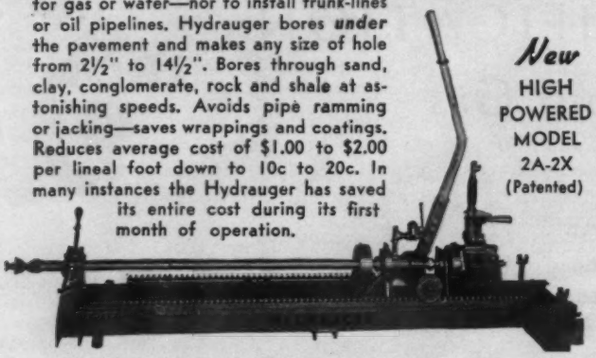
KITSON COMPANY
2409-15 Westmoreland St. Philadelphia, Pa.

No More Tie-ups
OF HI-SPEED TRAFFIC

There's no need to tear up highways or streets just to install a service connection for gas or water—nor to install trunk-lines or oil pipelines. Hydrauger bores *under* the pavement and makes any size of hole from 2½" to 14½". Bores through sand, clay, conglomerate, rock and shale at astonishing speeds. Avoids pipe ramming or jacking—saves wrappings and coatings. Reduces average cost of $1.00 to $2.00 per lineal foot down to 10c to 20c. In many instances the Hydrauger has saved its entire cost during its first month of operation.

Send for Bulletin No. 5

New HIGH POWERED MODEL 2A-2X (Patented)



ELIMINATES DITCHING and TUNNELING.
PROTECTS PIPE WRAPPINGS and COATINGS.
AVOIDS PAVEMENT BREAKING and REPAVING.
SPEEDIER THAN ANY OTHER METHOD.
PROTECTS TRAFFIC FROM HAZARDOUS OBSTRUCTIONS.
SAVES ITS COST QUICKLY, OFTEN ON A SINGLE JOB.

HYDRAUGER
"The Mechanical Gopher"

Get the New Bulletin on
INSULBRIX

Hundreds of Installations Prove Their Superiority Over Other Insulators and Heavy Refractories

Tells Advantages Users Have Gained

Send for Bulletin 328 G

QUIGLEY COMPANY, INC.
56 W. 45 ST., NEW YORK, N. Y.

Distributors with Stocks and Service in Important Industrial Centers Throughout the United States, Canada, and in 32 Other Countries.
In Canada, Quigley Company of Canada, Limited, Lachine, P. Q.

As indicated earlier in this article, the extremely high figure surprised even members of our own company.

The 96 per cent becomes even more significant with a scanning of some of the specific interviews. Some of these revealed comments from customers that gas heat was costing more than they had paid for fuel in the past but such statements invariably were accompanied by expression, direct or implied, that it was worth the difference.

Nor did the benefits of the survey end with satisfying the Peoples Gas organization that the overwhelming majority of its heating customers were satisfied.

The Company was able to give satisfactory explanations and correct practically all of the undesirable conditions of which the dissatisfied four per cent complained.

A large number of new prospects also were obtained through contacts made in the call back program while satisfaction among the present users was increased by the company showing an unusual interest in them.

A number of definite steps were taken by The Peoples Gas Light and Coke Co. to capitalize upon its unusual survey in Chicago.

The list of satisfied users was divided into groups coinciding with each salesman's territory, together with pertinent data on each installation. Salesmen were advised how to use such lists discreetly, avoiding annoyance to present satisfied users.

Those among satisfied users who had positively volunteered aid to the company in obtaining new heating customers were also grouped as to salesmen's territories.

A separate file of the four per cent dissatisfied users was set up for further call backs.

The results of the survey, showing as it did a 96 per cent satisfaction among heating customers, not only provided invaluable information for salesmen to use in talking to prospects, but it also suggested a convincing theme for advertising.

All in all, the time spent in making the survey, even though it required considerable valuable engineering "man hours," is deemed by the Peoples Gas Light and Coke Co. to have been time well spent.

■ ■

N. P. Heath Named on Board

N. P. Heath, power superintendent, Southwestern Gas and Electric Co., Biloxi, Miss., has been named on the board of directors of that company. Mr. Heath, who has been associated with Southwestern since 1914, succeeds R. M. Winnsborough who recently resigned.

"Grand Old Man of Oil Industry" To Be Chosen

One of the features of the 10th International Petroleum Exposition, to take place May 14-21, in Tulsa, Okla., will be the selection of the "Grand Old Man of the Oil Industry." Nominations for the "Grand Old Man" are being received by the Historical Sub-Committee of the Old Timers Committee of the exposition.

According to H. R. Gruber, chairman of the Old Timers and oil country sales manager, Union Wire Rope Corp., Tulsa, the "Grand Old Man" must have been actively engaged in the oil industry for at least 50 years and have contributed to the development of the industry. The recipient of the "Grand Old Man" medal at the 1936 exposition was Martin H. Mosier of Los Angeles.

■ ■

Harvey Heads Bryant Heater As Company Plans Expansion

Lyle C. Harvey, former vice-president of the Bryant Heater Co., Cleveland, Ohio, on March 22, took over the duties of president and general manager of the Bryant company. Gordon Rieley, formerly sales manager, is now vice-president in charge of sales.

According to the company announcement, the Bryant promotions are part of a new program for increased activity. The program is the result of a survey of the gas heating industry and effective ways to increase business with and for gas companies. Under the new program the S. R. Dresser Manufacturing Co., Bradford, Pa., parent company of Bryant, will continue to supervise Bryant affairs through Fred A. Miller, board chairman for both companies, and H. N. Mallon, Dresser president, and now chairman of the Bryant Co. executive committee.

■ ■

Consolidated Edison Makes Organization Changes

The following organization changes were recently announced by W. Cullen Morris, vice-president in charge of System gas engineering operations, Consolidated Edison Company of New York, Inc.: A. E. Turner, superintendent, was made manager of the Customer Service Department; C. E. Muehlberg, assistant general superintendent, succeeds Mr. Turner as general superintendent. W. C. Oeckler, assistant general superintendent, continues in that position. Alfred W. Fuller, former assistant superintendent, was made superintendent of the gas Meter Repair Bureau. His assistant superintendents are Frank J. Kelly and David R. Jones.

■ ■

Kahn is Vice-Chairman of A.G.A.E.M. Range Division

Lucian Kahn, treasurer of the Estate Stove Co., Hamilton, Ohio, has been appointed vice-chairman of the domestic gas range division of the Association of Gas Appliance and Equipment Manufacturers, Merrill N. Davis, association president, has announced.

A.G.A.E.M. Prize Parade Enrolls 650 Utilities

C. W. Berghorn, managing director of the Association of Gas Appliance and Equipment Manufacturers, has announced that latest reports on the automatic gas water heating Prize Parade participation show an enrollment of 650 gas companies and 3400 gas company salesman since the opening of the campaign in January. This represents a larger gas company enrollment than in the entire duration of the 1937 Golden Faucet Contest.

Approximately 28,000 plumbers and retail water heater dealers throughout the country are also actively promoting the campaign.

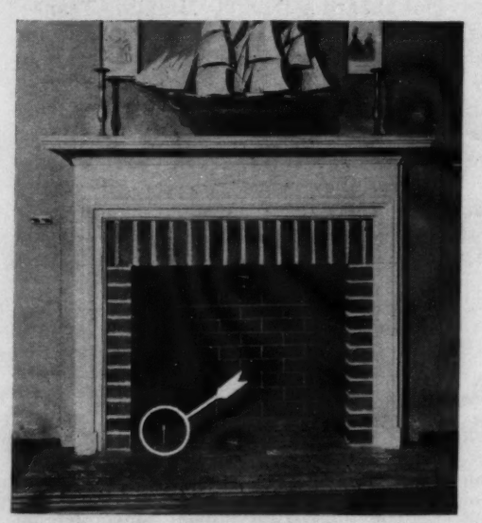
■ ■

Standard Gas and Electric Has Reorganization Plan

Bernard W. Lynch, president of the Standard Gas and Electric Co., Chicago, Ill., has announced that the formal order of confirmation of a plan of reorganization of the Standard company has been signed by Judge John P. Nields in the United States District Court for the District of Delaware at Wilmington.

Upon consummation of the plan the company proposes to register as a holding company with the Securities and Exchange Commission under the Public Utility Act of 1935. Soon after the conclusion of reorganization proceedings the company has agreed to advance a program which will provide for the reduction of its funded debt.

Untouched New Load.....



Millions of empty and wood or coal burning fire places are waiting to be converted into additional sources of profitable revenue. Capitalize on this vast, untouched field. Investigate the tremendous load-building possibilities of GLO-FIRE, the gas log that is completely revolutionary.

WITH

GLO-FIRE

©

THE APPROVED ODORLESS GAS LOG

A Circulating Heater

AMERICAN GAS ASSOCIATION · APPROVED · COMPLIES WITH NATIONAL SAFETY REQUIREMENTS

For full particulars write

The Glo-Fire Sales Division

3350 West First Street

Los Angeles, Calif.

Gas Company engineers have endorsed GLO-FIRE as one of the country's most efficient circulating heaters. Its amazing similarity to a glowing log fire has won nationwide distinction. Perfect eye appeal plus highest efficiency makes GLO-FIRE the greatest potential new load builder.

CURB METER Protection

Sectional Meter Boxes

Furnished in combinations suitable for single and multiple set-ups, high and low pressure. Features: (1) Sections resist displacement when installed and are securely locked together by concealed rods. (2) Boxes may be lengthened without removal. (3) Knockouts are provided for pipe connections.

Valve Boxes

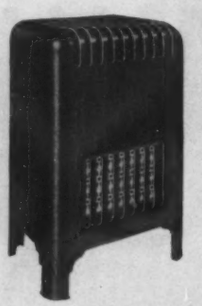
We also furnish curb valve boxes with break-away pipe slots for varying depths.

Originators and Manufacturers

ART CONCRETE WORKS

PASADENA—366 S. Fair Oaks Ave.
OAKLAND—2400 Adeline Street.
JACKSONVILLE, FLA.—564 Stockton Street
BIRMINGHAM, ALA.—4523 First Ave. North

New 1938 Model



The heater that SMILES while it Warms

FRASER

Radiant Front Console

Notice the modern streamline design and the two-tone walnut finish. Made in five sizes from 20,000 to 60,000 B.T.U.'s. Also available with built-in fan.

MANUFACTURED BY
FRASER FURNACE CO.
STOCKTON, CALIFORNIA

DISTRIBUTED BY
H. R. BASFORD COMPANY
425 Second St., San Francisco
911 S. Grand Ave., Los Angeles

Left to right, Russel Moebius, Beverly Hills agent, Railway Express Agency, Harry Goakes, chief dispatcher, Western Air Express, and Edward A. Schweitzer, traffic manager, Payne Furnace and Supply Co., are shown checking the three Payne Floor Furances aboard a Western Air Express Mainliner for shipment to Miles City, Montana.

Plane Carries Payne Furnaces to Montana Utilities Convention

THE Payne Furnace and Supply Co., Beverly Hills, Calif., recently sent the first gas furnaces ever to attend a convention by plane, from Los Angeles to the March sales conference of the Montana-Dakota Utilities Co. at Miles City, Mont.

The three Payne floor furnaces, which took the unusual trip, incorporated new features in gas heating design and were to be given an initial showing at the Miles City Convention. However, the day they were shipped, one of the worst storms in California history disrupted rail traffic and the furnaces could not be rerouted.

One day before the convention opened, they were traced and returned to the Beverly Hills plant. After a conference with Railway Express and Western Air Express officials, the Payne traffic department sent the furnaces and display equipment, all of which weighed 632 lbs., to the Union Terminal at Burbank where they were put aboard a Douglas Mainline Transport which the company had to charter for the purpose.

Flying into Salt Lake City, the furnaces were rerouted to Butte, Mont., by Railway Express, and then by special Express truck to Miles City where they were received in ample time for the convention's opening.

Sharples Solvents Offers Pamphlet on Pentalarm

The Sharples Solvents Corp., Philadelphia, Pa., has just issued a descriptive bulletin on its product, Pentalarm odorant for fuel gases, according to word from H. J. Hooper, general sales manager. The four-page pamphlet, which is published in color, gives the physical properties of the warning agent and describes the equipment used in injecting the odorant into the gas distribution system. Equipment can be fabricated by company welders from materials on hand.

Illustrations in the pamphlet show the Osmoscope, a by-pass odorizer wick section, and the by-pass odorizer installed. The bulletin includes also a Pentalarm solubility chart and outlines 12 salient points to consider in using a warning agent for fuel gas. Copies will be furnished upon written request to the Sharples Solvents Corp., 23rd and Westmoreland Sts., Philadelphia.

■ ■

Canadian Gas Association To Hold June Convention

The thirty-first annual convention of the Canadian Gas Association will be held June 9-10 at the Royal York Hotel, Toronto, Canada, George W. Allen, association secretary, has announced. Papers to be presented at the convention will include the following subjects: water heating with gas, kitchen gas appliances, gas house heating, distribution, detecting gas leakage. Merrill N. Davis, A.G.A.E.M. president, will speak.

Another Semet-Solvay Steam Accumulator Goes into Service

• Another carbureted water gas plant now gets its process steam very cheaply from a new Semet-Solvay Steam Accumulator.

This helpful apparatus, with its streamlined baffles, assuring good mixing, its many distinctive features of design, pays for itself rapidly in the boiler fuel it saves. It can be built in any size to fit specific requirements, and can be located out of the way in comparatively small space. Its operation is automatic.

We invite inquiries from water gas plants whose holder costs could benefit by saving three to five pounds of boiler fuel per MCF. There is no obligation in asking for a calculation based on your own conditions.

SEMET-SOLVAY ENGINEERING CORP.

Engineers • Contractors

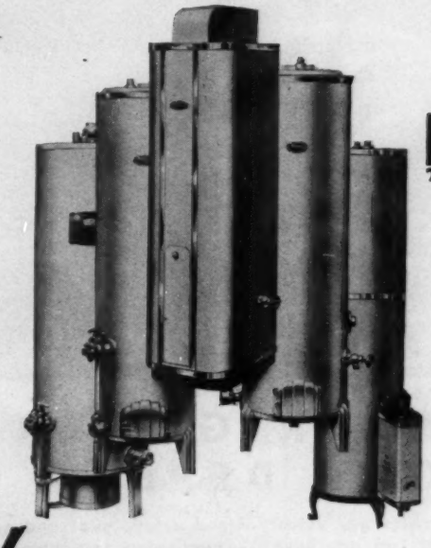
40 RECTOR STREET, NEW YORK, N.Y.

ONLY 245 MORE DAYS

1938 CAN STILL BE YOUR BIGGEST WATER HEATER YEAR

HOTZONE HEATERS have customer acceptance for thoroughly dependable, efficient service. Their beautifully finished exterior instantly attracts. They utilize the luminous flame burner with 100% safety features.

HOTZONES include a type and size to fit every domestic requirement and every pocketbook.



HOTZONE Welsbach

Automatic Storage Gas Water Heaters

Get full details of Campaign Aids

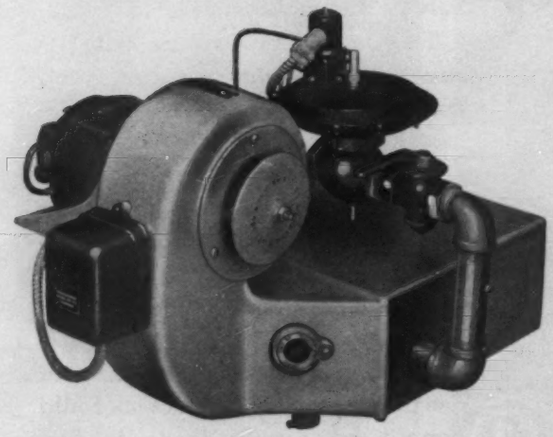
Welsbach Company

Gloucester City, N. J.

Branches in Chicago and San Francisco

Since 1887 Pioneers in the Manufacture of Gas Burning Appliances

"FAN-AIR" — Conversion Unit



The ideal Burner for conversion jobs under adverse conditions.

FAN-AIR embodies the popular Mettler Entrained Combustion Gas Burner featuring mechanical draft with full automatic control and flexibility of adjustment from incandescent flameless to long flame combustion.

Ideally suited for difficult conversions such as Scotch Marine or fire box boilers and many industrial applications having high overload conditions, improper furnace designs with insufficient volume, short firing depths, short stacks, draft deficiencies, etc.

Make difficult jobs easy with the Standardized FAN-AIR unit—sizes from 10 to 100 H.P.

LEE B. METTLER CO.

406 So. Main St. Los Angeles, Calif.

THERMOVALVE

*ANOTHER GENERAL YOU CAN *DEPEND* ON

This new manual-reset gas valve automatically shuts off gas flow if pilot light fails, and remains closed until reset by hand. Actually the THERMOVALVE is a combined safety pilot and gas valve —particularly valuable where no current is available, — or where non-current-failure controls are used. Full information on request.

GENERAL CONTROLS

1505 Broadway, Cleveland, Ohio
267 5th Ave., New York City, N.Y.
1370 Harrison St., San Francisco, Calif.
450 East Ohio St. Chicago, Ill.

Royal Air Conditioning Co. Offers Small Winter Unit

A SELF-CONTAINED winter air-conditioner-circulator to retail for less than $100 was announced last month to gas companies and heating appliances dealers by the Royal Air Conditioning Equipment Co., Los Angeles, makers of the Race line.

Designed to fit in room corners, and to blend with the modern trend in home decoration, these new and smaller Race units feature a 45,000 B.t.u. input and almost all of the improved mechanical features of the larger Race units.

Only 49 in. high, the new unit is no larger than a radio cabinet. It comes in four distinctive finishes, can be operated without ducts, and features Venetian Air Grills for the directional flow of air delivery.

According to J. H. Moore, one of the organizers of the company, the new Race unit will supply heat and filtered air for from 5,000 to 7,000 cu. ft. of floor space. Completely automatic, and with switch for summer operation, it is ideally suited for many of the small homes now being built under the terms of the Federal Housing Act.

■ ■

Norton and McMurray Form New Manufacturing Company

Charles E. Norton and F. A. McMurray have resigned their respective positions with S. R. Dresser Manufacturing Co. and the Dayton Division of National Supply Co., to form, on April 1, the Norton McMurray Manufacturing Co., distributors and manufacturers of gas distribution and pipe line equipment. The new company is incorporated in and headquarters in Chicago.

Mr. Norton formerly had charge of the Chicago office of the Dresser Co. and Mr. McMurray, located in the Chicago office of National Supply Co., represented the Dayton Division nationally.

■ ■

Report to Employees Issued By Wisconsin Corporation

The Wisconsin Public Service Corp., Green Bay, Wis., has recently released a four-page Annual Report to Employees, based on the information contained in the company's Annual Report to Stockholders.

The report for employees is part of a program established last October when the company started publishing regular Quarterly Reports to employees. The publication of these reports has proved beneficial to employee relationships and has enabled employees to better discuss company problems with the public.

■ ■

Pennsylvania Gas Association Meets At Skytop Lodge, Pa.

Meeting at Skytop Lodge, Skytop, Pa., May 3-5, the Pennsylvania Gas Association will devote its annual convention program to distribution, accounting, customer and employee relations, production and new business problems of the gas industry. The convention will open with the annual banquet, May 3. Following a short business session, Howard S. Christman, association president, will deliver an address.

Two Pacific Lighting Subsidiaries Plan $5,000,000 Expenditure in 1938

NORMAL increase in gas business during 1938, together with projected additions and betterments to the natural gas transmission and distribution system, will require capital outlays by Southern California Gas Co. and Southern Counties Gas Co., both Los Angeles subsidiaries of Pacific Lighting Corp., San Francisco, Calif., in excess of $5,000,000, it is estimated by officials of the companies.

Proposed items of expenditure over the Southern California system, serving approximately 675,000 meters, aggregate nearly $4,000,000. About $1,480,000 is budgeted for gas main extensions, new services and new meters. The balance is set up for such contemplated items as new buildings, replacement and relocation of piping and equipment, laying of new production and transmission pipe lines and similar jobs.

Assuming that home building will be stimulated by the new federal housing act, but allowing for less reassuring economic factors, Southern California Gas Co. officials estimate that 18,900 new services will be added to the company's distribution system during the year. Southern Counties Gas Co., serving approximately 165,000 meters, expects an increase of 6,500 customers over its system in 1938, and has allocated $617,000 in the new budget for this item.

The extensive program of pressure reinforcement carried through last year to insure a wider margin of safety during peak periods such as occurred in the winter of 1936-37, was virtually completed. However, the Southern California Gas Co. has included several pressure reinforcement jobs in the present budget, and Southern Counties Gas Co. will complete the erection of a series of high pressure holders, some of which were started in 1937.

These holders, seven in all, will serve to reinforce and equalize pressure conditions, and provide an emergency supply in case of interruptions to service.

Anticipated developments for the year 1938 over the Southern California Gas Co. system are expected to require the construction of additional dehydration and cooling equipment for natural gas supply. It is contemplated that from 12 to 20 miles of 10-, 12-, and 16-in. pipe will be needed for production and transmission lines.

■ ■

P. G. and E. Reduces Rates $2,000,000 Annually

Pacific Gas and Electric Company's natural gas rates, already among the lawest in the country, were reduced another $2,000,000 a year on April 1 by order of the California State Railroad Commission. This is the second substantial cut the San Francisco utility has made in its rates in less than two years. In May of 1936 a reduction of $2,600,000 yearly was put into effect.

Under the new reduction the bulk of savings will go to the company's 500,000 residential and commercial customers whose bills will benefit with an average cut of 9.4 per cent. The rate reduction followed a study of rates made by the Commission over a period of several months.

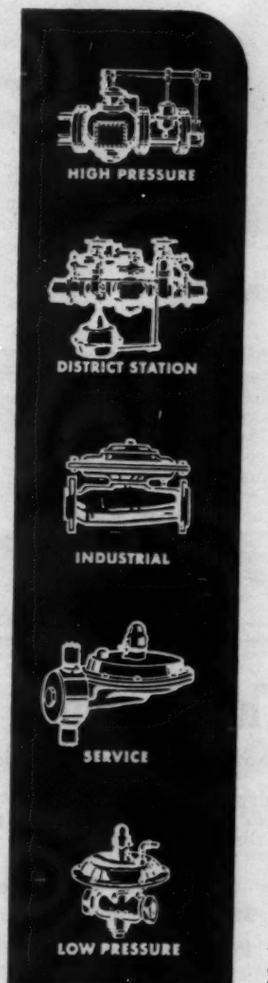
This reduction is in no way related to the litigation now going on in the Federal courts involving approximately $7,000,000 impounded as the result of the company's protest against rate cut ordered by the Commission on November 13, 1933. This cut involved $2,000,000 which the company contended was more than it was able to assume at that time. Its injunction to restrain enforcement of the order was upheld in the Federal District Court and that decision was in its turn upheld when the Commission appealed to the Supreme Court of the United States.

■ ■

Arthur Stockstrom Named President Of American Stove Company

Arthur Stockstrom was elected president of the American Stove Co., St. Louis, Mo., at a recent meeting of the board of directors. Mr. Stockstrom, who was elevated from the office of secretary, succeeds his father, Louis Stockstrom, president of the company since 1927, who was named chairman. George E. Baker was elected secretary-treasurer and C. P. Fiske was named assistant treasurer.

S. E. Little, Cleveland; R. K. Clark and A. F. Millikan, Chicago; and I. W. Peffly, New York, were re-elected vice presidents. American Stove Co. is the manufacturer of Magic Chef gas ranges.



☆

REYNOLDS manufactures a complete line of Gas Control Regulators. Each one in its line is designed and built to meet a specific requirement of the Gas Control field.

Correct principle, sound design and dependable performance are just three of the many reasons why Reynolds Gas Control Units enjoy preference on most specification sheets. These careful buying gas executives also know that the unquestionable after-installation performance of every Reynolds Unit is backed by nearly a half century of experience.

When your next Gas Control problem arises, call REYNOLDS —their cooperation policy is one too important to overlook.

*

REYNOLDS Products for all kinds of Pressure Reductions— for either Natural or Artificial Gas.

High Pressure Service House Regulators—Straight Lever Type—Models 0-10-20 Series. Toggle Lever Type—Model 30 Series.

Low Pressure Service or Appliance Regulators.

District Station Regulators, Single or Double Valve—Auxiliary Bowl and Automatic Loading Device Optional.

High Pressure Line Regulators—Pilot Loaded—Pilot Controlled.

Toggle Type Regulators—Single Valve, Double Valve, Triple Outlet.

Seals—Dead Weight or Mercury . Back Pressure Valves . Automatic Quick Closing Anti-Vacuum Valves . Automatic Shut Off Valves . Lever Operated Valves . Louver Operated Device . Atmospheric Regulators . Vacuum Regulators.

☆

Branch Offices:
421 Dwight Building
Kansas City, Mo.
2nd Unit,
Santa Fe Building
Dallas, Texas

☆

Representatives:
Eastern Appliance Co.
Boston, Mass.
Wm. A. Ehlers
East Orange, N. J.

REYNOLDS GAS REGULATOR CO.
ANDERSON, INDIANA, U. S. A.

American Stove Co. Has New Sales Promotion Plan

American Stove Co., Cleveland, Ohio, recently released a new sales promotion plan, featuring the Magic Chef Gas Ranges. Based on the 3100 Series Magic Chef, the plan includes promotional pieces, consisting of newspaper ads, colorful streamers, display cards, combination window and floor display, die-cut star stickers, mailing pieces, envelope stuffers, trailer films, and radio.

The new campaign can either be used as a complete "5-Star" program, or any portion can be used. The number of helps the dealer uses classifies his promotion program. Any combination of two items carries the "2-Star" rating. Any combination of three or four items carries the "3-Star" or "4-Star" rating and so on to the highest rating of "5-Star."

Copies of the plan can be obtained by writing American Stove Co., Advertising Department, 1825 East 40th St., Cleveland, Ohio.

■ ■

General Gas Light Sales Dept. Has New Members

The General Gas Light Co., Kalamazoo, Mich., has announced that R. O. Berry and George H. Hilliard are new members of the company sales department. Mr. Berry, formerly sales manager of Jacksonville Gas Co., Jacksonville, Fla., will represent General Gas Light in the sale of heating and lighting equipment, in the southeastern states, while Mr. Hilliard, formerly manager of Alabama Utilities Service Company of Tuscaloosa, will take charge of sales in the south central states.

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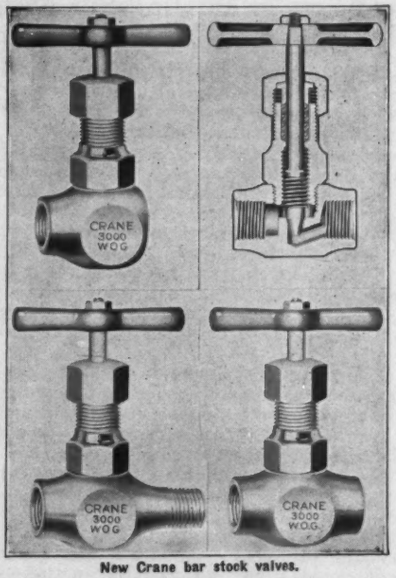
Ohio Co. in New Location

Paul Wagner, Fostoria, Ohio, manager for the Ohio Fuel Gas Co., Columbus, Ohio, recently announced that the gas company has leased the Eissler Building in Fostoria for the company's local headquarters. Mr. Wagner declared that the move was planned for April, following the completion of the redecoration plans and the rearrangement of the interior of the building.



New Crane bar stock valves.

Crane Co. Introduces Three New Bar Stock Valves

Three new small 3,000 lb. W.O.G. plug type disc, globe and angle bar stock valves are being introduced by Crane Co., Chicago. These are particularly adapted for connections on orifice meters, regulator leads, by-passes, gages, for use as expansion valves on ammonia lines and for many similar services where accurate regulation flow is desired or where parts of measuring instruments must be protected against the sudden release of high pressures.

All of these valves may be packed when wide open when under pressure. They are furnished either in steel, Exelloy or 18-8 chrome nickel alloy.

The Exelloy valves are particularly suitable for handling gas containing sulphur compounds or for installations exposed to atmospheric corrosion.

The new globe valve, No. 222½, is made with male and female ends in sizes ⅛ to ¾-in. inclusive. Sizes ⅛-in. and one-in. also are being added to the existing Crane line or bar stock valves known as Nos. 222 and 223.

■ ■

American Brass Co. Issues Anaconda Publication

The American Brass Co., Waterbury, Conn., has recently issued a 28-page, illustrated booklet dealing with Anaconda copper tubes and fittings for domestic hot water heating lines, including suggestions for pipe sizing. Also included in the new publication are a plan layout of copper tube reversed return system, as well as the procedures for assembling solder type fittings and for assembling flared tube fittings.

■ ■

Herbert W. Alrich Dies

Herbert W. Alrich, engineer for Consolidated Edison Company of New York, Inc., and authority on gas holders, died March 25, on a New York Central train, entering Syracuse, N. Y.

During his connection with Consolidated Edison, Mr. Alrich was actively associated with the construction, extension and maintenance of all gas plants and gas holders of the company and affiliates.

The Goodman Stopper

The Reliable Shut-off for Street Mains

Equipped with Improved Patented Locking Sleeve, which locks both handles to the pipe. Stopper cannot slip. **Gas cannot pass.**

Safety Gas Main Stopper Co.
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REASONS WHY THE

GREENLEE

HYDRAULIC PIPE PUSHER SAVES TIME AND MONEY

It makes extensive trenching, back-filling, etc., unnecessary and saves tearing up lawns and pavements.

Under usual conditions, one man can operate the levers with ease.

It has several speeds to suit varying soil conditions.

Depending on the length of base used, it will push from 4 to 7 feet with but one setting of the pipe clamp.

It is easy to handle and simple to set up and operate.

The Greenlee Pusher consists of a hydraulic unit which operates on a notched steel base. Pumping the levers sets up pressure within two oil cylinders, causing the body of the pusher to move forward against the pipe clamp. Depressing the levers releases the pressure, permitting springs within the unit to move the pistons forward to a new notch.

It will pay you to investigate this money-saving method of pushing pipe. Write for full details now.

GREENLEE TOOL CO., 1700 Columbia Ave., ROCKFORD, ILLINOIS

Protects gas users—

"CALODORANT" gives a swift warning against leak danger

CALODORANT gas odorizing agent has a distinctive and penetrating odor that is generally associated with manufactured gas. For over seven years leading gas companies have found it to be a vigilant detector of dangerous and costly leaks. Immediately upon the addition of CALODORANT to gas, it gives warning of leaks in distributing systems and household appliances—a warning that may prevent loss of life and property. CALODORANT will remain completely vaporized during long periods of transmission and the odorizing power remains unimpaired. It adds no odor to burning gas. It is non-corrosive — non-injurious to equipment or users.

CALODORANT

Reg. U. S. Pat. Off.

GAS ODORIZING AGENT

Available in tank cars and iron barrels

Address Inquiries to

Standard Oil Company of California

225 Bush Street, San Francisco, Calif. **30 Rockefeller Plaza, New York, N. Y.**

P. J. Lochbaum Seeks Gas Industry Connection

P. J. Lochbaum, Box 23, Fairbanks, La., who for 16 years has specialized in work pertaining to the natural gas industry, is at the present time seeking a new affiliation.

Mr. Lochbaum's experience may be outlined as follows: 11½ years as superintendent of measurement and control and practical gas engineering in the wholesale production, purchase, sale, distribution, transmission and compression of gas; three years in the retail distribution of gas; one year in the manufacture of meters, regulators, appliances, etc.; one half year of miscellaneous natural casinghead gas experience in oil fields.

For reference concerning Mr. Lochbaum's work, communicate with F. H. Lerch, Jr., president, Interstate Natural Gas Co., Inc., Rm. 2800, 30 Rockefeller Plaza, R.C.A. Bldg., New York City.

■ ■

Gas Industry Revenues Up 1.6% in January Over 1937

Total revenues of the gas industry in January were $80,714,500, an increase of 1.6 per cent over January, 1937, according to statistics prepared by the American Gas Association. Natural gas sales for electric generation increased 21.3 per cent in January over the previous year. Total industry revenues for December, 1937, showed an increase of 4.3 per cent over December, 1936, while total natural gas revenues rose 7.0 per cent above the December 1936 figures.

■ ■

United Corp. Changes Policy

The United Corp., New York, registered as a utility holding company blanketing the Eastern seaboard, is now formulating a new policy which will transform the corporation into purely an investment company.

GEORGE A. BURRELL

Petroleum and Gas Engineer

Design—Construction—Reports

◆

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Pacific Coast Sales Representative. Twenty years experience. Wishes new line of gas appliances for coast territory. At present in the East and can visit factory for discussion.

JOE MOORE
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EXCLUSIVE design of Mueller Gas Era Furnace gives longest life—lowest operating cost.

L. J. MUELLER
FURNACE COMPANY
MILWAUKEE

HIGH CAPACITY—SMALL SIZE!
LOW PRESSURE REGULATORS

NOW Built in NINE Sizes
Highest Capacities Before
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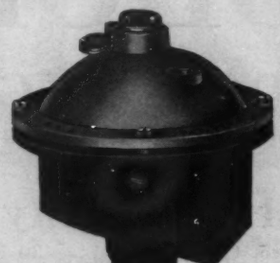
NOW even greater capacities

Perfect regulation at all pressures! Exceptionally low lock up! A small size, LOW COST regulator with highest capacities for all types of gas appliances.

The H. M. Thermo Control Co.
814 E. 108th St. Los Angeles, Cal.



AGA—LISTED
Write for more information.

General Controls Produces Automatic Shut-off Valve

A new gas valve that automatically shuts off the gas flow in case of pilot light failure is announced by the General Controls Co. under the trade name, Thermovalve, which is actually a thermocouple pilot and manual reset gas valve combined. The tip of the couple is placed in the pilot flame and the valve is set open by hand by removing cap at bottom and pushing up on the stem. No current is required, the thermocouple when heated developing enough current to hold the valve open. If the pilot light fails, the valve closes.

The Thermovalve is particularly valuable in controlling installations where no current is available and where a complete gas and pilot shutoff is required; or where non-current-failure controls are used.

A new bulletin on this new product may be had by writing the General Controls Co., 700 Ivy Street, Glendale, Calif.

■ ■

Ward Heater Co. Appoints Roberts to Midwest

W. D. Roberts has been appointed midwest representative of the Ward Heater Co., with headquarters in Chicago.

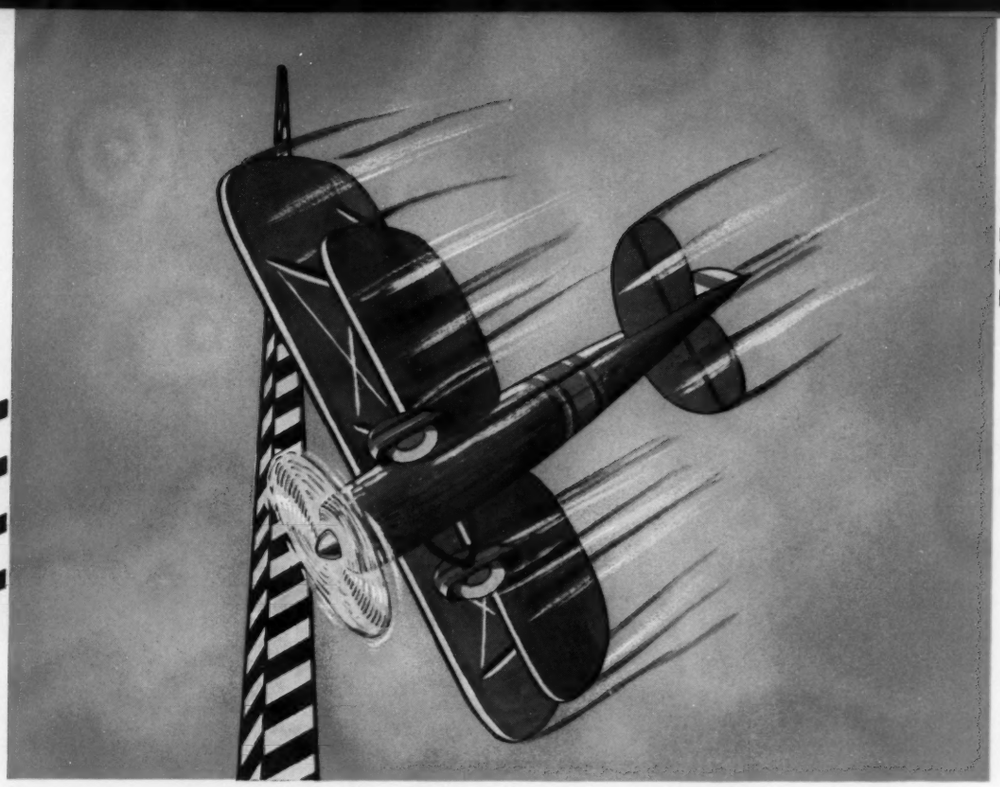
For many years Mr. Roberts had charge of the laundry section of the People's Gas Stores and worked part of the time immediately under Ernie Davies, then commercial manager of the Peoples Gas Light & Coke Co. Mr. Davies was responsible for the introduction of Ward Floor Furnaces in the Great Lakes area. Through Mr. Davies, the Ward Co. arranged the appointment of Mr. Roberts to assist in expanding the company's midwestern sales.

■ ■

Olcott Joins Staff of Bozell and Jacobs Inc.

H. W. Olcott has joined the staff of Bozell and Jacobs Inc. as assistant to E. Lundgren, vice-president in charge of the Indianapolis office, effective April 18.

Mr. Olcott was formerly advertising manager of the Philadelphia Gas Works Co., resigning his post there to become associated with Daniel Starch and Staff, New York City, where he was account executive for the New England, New York and Pennsylvania gas and electric properties of the Associated System. Prior to moving east, Mr. Olcott was advertising manager of the southern Indiana properties of Midland United Co.



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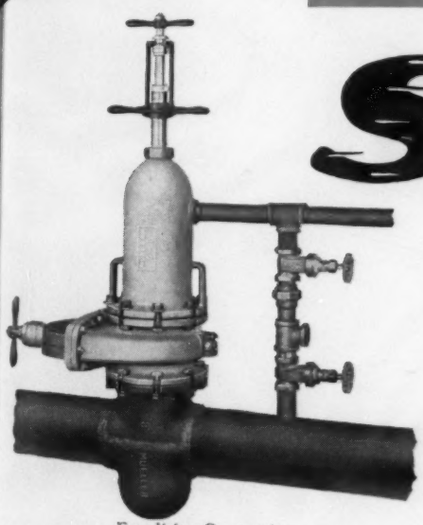
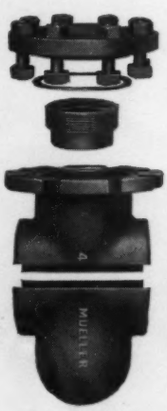
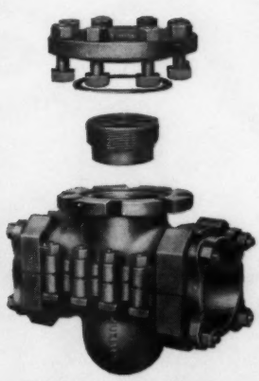


Equalizing Connection

It's so easy to speed work along when you use MUELLER PRESSURE CONTROL FITTINGS AND EQUIPMENT. There is no time lost locating the nearest shut-off valve because this equipment is made to make a complete shut-off at the exact spot the work is to be done. The shut-off is made with complete safety, there is no need to interrupt service as the supply continues without loss of pressure while the work is being done.



Weld Type



Mechanical Joint Type

Completed Installation

Speed means time and time means money when extending or repairing a gas distribution system. You can assure yourself of the utmost efficiency by using MUELLER PRESSURE CONTROL FITTINGS AND EQUIPMENT. If you are not already acquainted with what it is and how it is used, write today to Dept. 438, Mueller Co., Decatur, Illinois for full information.

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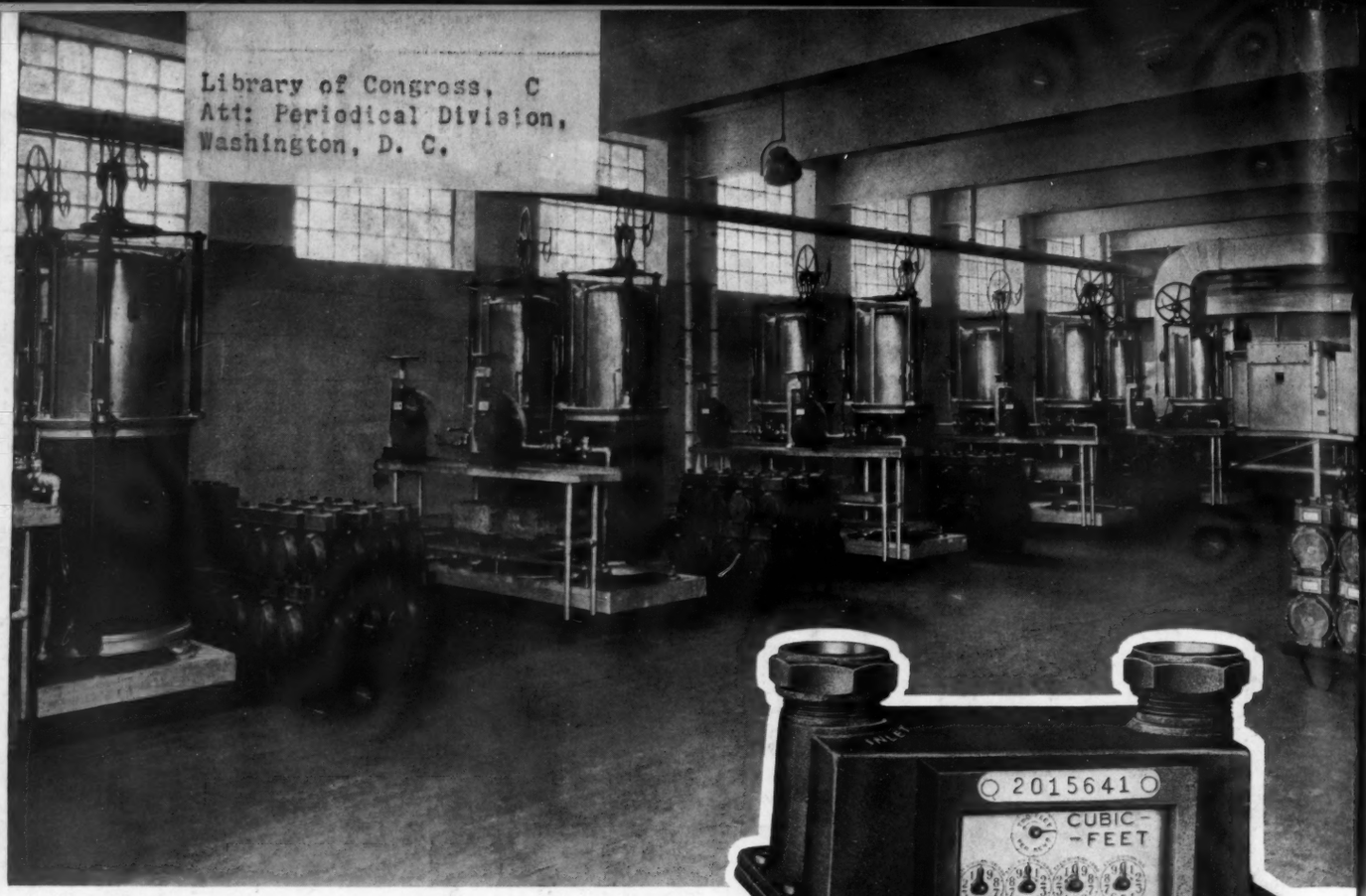

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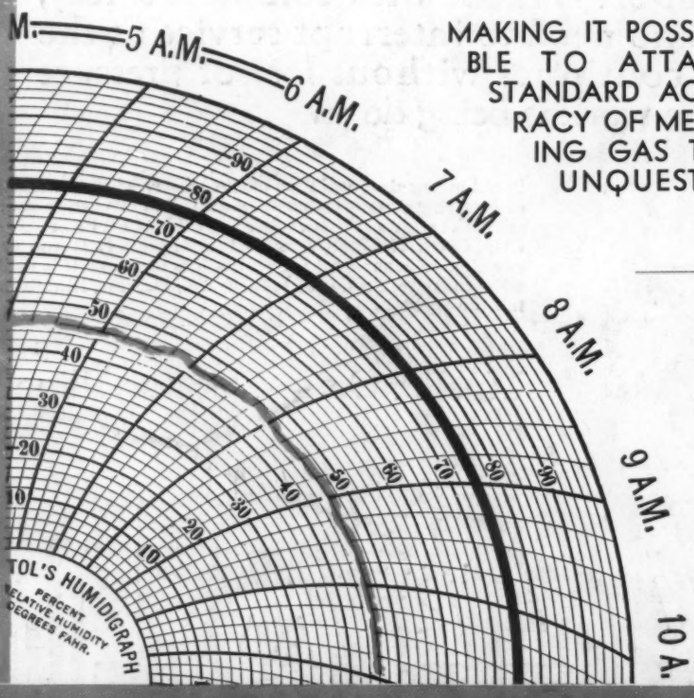

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